FINAL REPORT

Marine Towed Array Technology Demonstration Blossom Point Research Facility

ESTCP Project MM-0324

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ACRONYMS

Acronym	Explanation		Acronym	Explanation
ARL	Army Research Laboratory		MHz	megahertz
BRAC	Base Realignment and Closure		MM	Military Munitions
CAD	Computer Assisted Design		MMRP	Military Munitions Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act		MPPEH	Material Potentially Presenting an Explosives Hazard
COG	Course-Over-Ground		MTA	Marine Towed Array
COTS	Commercial, Off the Shelf		MTADS	Multi-sensor Towed Array Detection System
CTT	Closed, Transferred, and Transferring		NOAA	National Oceanographic and Atmospheric Administration
DAQ	Data Acquisition System		nT	nanotesla
DAS	Data Analysis System		NAD	North American Datum
DoD	Department of Defense		NAVFAC	Naval Facilities Command
EE/CA	Engineering Evaluation/Cost Analysis		NEODTD	Naval Explosives Ordnance Detection Technology Division
EMI	Electromagnetic Induction		NOSSA	Naval Ordnance Safety and Security Activity
EOD	Explosive Ordnance Disposal		NTCRA	Non-Time Critical Removal Action
EOTI	Explosive Ordnance Technology Inc.		PCB	Printed Circuit Board
ERDC	Engineer Research and Development Center		QA	Quality Assurance
ESTCP	Environmental Security Technology Certification Program		QC	Quality Control
FUDS	Formerly Used Defense Site		RI/FS	Remedial Investigation/Feasibility Study
GPS	Global Positioning System		RTK	Real-time Kinematic
GUI	Graphical User Interface		SAIC	Science Applications International Corp.
HAE	Height Above Ellipsoid		SCI	Structural Composites Inc.
Hz	Hertz		SERDP	Strategic Environmental Research and Development Program
IMU	Inertial Measurement Unit		SI	Site Investigation
Knot	Nautical Mile/hour = kt		TCRA	Time-Critical Removal Action
km	Kilometer		USACE	US Army Corps of Engineers
lb	pound		UTM	Universal Transverse Mercator
MB	megabyte		UXO	Unexploded Ordnance
MDE	Maryland Department of Environment		VCT	Vehicle Control Technologies, Inc.
MEC	Munitions and Explosives of Concern		WWII	World War Two

1.0 Introduction

1.1 Background

1.1.1 MEC in the Marine Environment

As a result of past military training and weapons-testing activities, MEC (Munitions and Explosives of Concern) is known to be present at many sites designated for Base Realignment And Closure (BRAC) and at Formerly Used Defense Sites (FUDS). Many of these sites associated with military practice and test ranges contain significant land areas with a marine component. Although it is known that between 10 and 20 million acres of dry land MEC contamination are associated with Closed, Transferred, and Transferring (CTT) ranges, the fraction of this area that is underwater and inaccessible to standard MEC search technologies is poorly defined; however, it likely exceeds a million acres. The marine environment presents a complex challenge for MEC search technologies, because it includes wetlands, fresh water ponds and lakes, estuaries, rivers, coastal bays, tidal flats, and ocean shores, including shallow water coral reefs.

Although much of the marine MEC contamination has resulted from overshoots of land ranges, off-shore areas also have been used as ranges. Furthermore, we must acknowledge that historically it was common to dispose of excess or unwanted munitions (often resulting from land clearances) by simply dumping the materials into an adjacent body of water. This is evident in many areas by simple inspection of the shoreline adjacent to target and practice ranges. In addition to MEC challenges associated specifically with ranges, there exist significant examples of MEC contamination associated with dredging and beach replenishment operations, as well as confined areas associated with Naval Bases and ammunition manufacturing and shipping operations that have potential or known underwater MEC contamination.

1.1.2 The Blossom Point Field Research Facility

The installation dates back to March 1943. Initially, the mission of Blossom Point was to support the testing of small experimental lots of fuzes and fuze components to support the war effort (WWII). The water range impact areas associated with Blossom Point are comprised of 14 distinct range firing fans overlapping into the Nanjemoy Creek in the west and northwest directions and into the Potomac River to the south, southeast and east from Blossom Point; the total marine area covers approximately 5,413 acres. Neither the shoreline or water areas are utilized any longer for testing munitions.

The ranges were used for the experimental testing of mortars, rockets and projectiles between 1943 and 1982. The area is open water owned by the State of Maryland and is used for a variety of recreational uses, including crabbing, fishing and boating. Since 1978 the installation has gone through several reorganization efforts by the Army and in 1992 it was absorbed in the formation of the Army Research Lab (ARL).

The munitions fired onto the Water Ranges include rockets (ranging in size from 2.75 in to 5 in), mortars (60 mm to 4.2 in), small arms, projectiles (ranging in size from 20mm to 105 mm), and bombs (20 lb to 750 lb).

1.1.3 The Demonstration Technologies

There currently exist no proven automated technologies for conducting MEC geophysical surveys that produce documented mapped data files showing the extent, densities, and types of ordnance contamination for the underwater environment. The application of automated survey technologies has become routine on land-based ranges using hand-held, man-portable, vehicular-towed, or airborne sensor arrays coupled to GPS (or other types of) navigation systems for precise positioning. Currently, underwater MEC searches are typically conducted by divers using hand-held metal detectors. Discovered targets are either prosecuted as they are found or they are marked with weights and floats for later reinvestigation.

SERDP in 2002 and ESTCP in 2003 issued calls for development and demonstration of Marine MEC survey systems for application in shallow water environments (up to 15 ft water depths) associated with current and former military ranges. In our 2002-2003 SERDP Project,[1] UX-1322, we carried out a marine engineering study of vessel parameters and sensor platform concepts and established designs for towed sensor platforms. Results of these studies are documented in the Project Final Report.[2]

In our 2003 ESTCP Project MM2003-24, we designed and constructed a marine towed-array UXO sensor system.[3] This platform, with nominally 4 m wide sensor arrays, is designed as an underwater flying wing. It is towed by a 20 m cable attached to a 30 ft long triple pontoon boat. The maximum design operational speed is 5 kt. The survey production rate is up to ~10 acres/hour. The attitude and depth of the sensor platform is controlled by an autopilot operating from a computer on the tow vessel. This system provides a truly unique capability for underwater UXO search systems. The survey products include digitally geo-referenced magnetic anomaly maps of metallic objects buried in the bottom sediments. The full array of dipole-based target analysis capabilities developed for the MTADS ground and airborne survey systems has been adapted for this application. This system was first demonstrated in a large UXO survey in the Currituck Sound adjacent to the Former Duck Bombing Range near Duck, NC[4] in late 2005. Blossom Point is the sixth large demonstration survey conducted with the MTA system.

1.2 Objectives of the Demonstration

This demonstration was conducted at the Blossom Point Research Facility of the Army Research Laboratory in cooperation with the ESTCP Unexploded Ordnance (UXO) Innovative Technology Transfer Program. It is part of a larger overall evaluation of the Blossom Point facility current and former ranges being carried out under the U.S. Army Military Munitions Response Program (MMRP). An SI has been completed[5] and an EE/CA study is currently underway which involves both the onshore and offshore ranges.[6] The objective of the MTA demonstration at the Blossom Point Research Facility is to characterize the former offshore ranges associated with the facility, particularly those in the Potomac River. The MTA demonstration is specifically supported by the ESTCP Program Office under Project MM2003-

24 and there are specific technology evaluations that will be made using the MTA platform that relate to its capabilities and adaptability to undertake new and different survey challenges.

The specific technological challenges for the MTA platform at this site include:

- The variable river bottom structure and the abruptly changing water depths associated with the primary river channel and recent and historical dredging actions that have taken place leaving dredge spoils along the river channel;
- Turbulent water conditions and strong currents in the river;
- Submerged vegetation in the river associated with recent Hydrilla infestation;
- Shallow water areas stretching from the shoreline to near the river channel.

The performance metrics used for measuring success of this demonstration included the following:

- System performance:

  - On-site logistics were established to support efficient demonstration operations. (Efficiency was determined by lost time during the demonstration to establish or modify the necessary support for the demonstration).
  - Demonstrated efficient survey platform deployment and recovery operations. (Efficiency was measured in lost time at the beginning and ending of each day's operations to deploy and secure the system and to ferry the platform to and from the survey area).
  - Demonstrated efficient component performance including actuators, navigation and location sensors, depth sounders, and the imaging sonar. (Efficiency was determined by the number and extent of breakdowns and work stoppages because of equipment failures and by whether the necessary spares were available to quickly recover from breakdowns and upsets).

- Survey performance of the sensor arrays:

  - Survey production rates are reported as hourly and daily rates (acres/hour or acres/day) for periods of deployment of the sensor array.
  - Maximize coverage area and minimize missed survey areas. (Performance was determined from course-over-ground and missed area plots).
  - The performance of the survey guidance system and the sensor platform autopilot depend on our ability to lay out and prosecute a survey grid, and our ability to follow underwater terrain and maintain the intended bottom separation. These were evaluated by course-over-ground plots and plots of command depth [or altitude] *vs.* achieved platform depth.

- Data acquisition performance:

  - Efficient integrated performance of all systems supporting the autopilot, the pilot guidance display, the television cameras, the imaging sonar, and the

magnetometer sensor data stream are evaluated and reported in this Demonstration Report).

- Creation of data products:
    - Mapped data files and images;
    - Target analyses; and
    - Target lists and recommended dig lists.
    - The quality of these work products were evaluated by their suitability to support target recovery operations following the demonstration survey.

1.3 Regulatory Drivers

This site has recently completed a Site Investigation (SI) and evaluation. The Site Investigation Report was completed by Malcom Pirnie, Inc.[5] Because of the proven MEC hazards at the site and the potential for public access to the site, an Engineering Evaluation/Cost Analysis (EE/CA) was underway[6] at the time of the MTA demonstration and a Non-Time Critical Removal Action (NTCRA) was being planned. Based upon the findings of the SI, Remedial Investigation for the Water Range Fan was recommended.

2.0 TECHNOLOGY

2.1 Technology Description

The MTA system consists of the fielded hardware, Figure 2-1 and software. The software utilities support data acquisition, data processing and preparation of the data for analysis, and separate platforms for carrying out analysis of the magnetic anomalies and characterizing and classifying their signatures. Separate utilities support production of graphics and spreadsheet products for subsequent target reacquisition and intrusive investigations, and the preparation of demonstration reports.

Figure 2-1. The 30 ft pontoon boat is shown towing the sensor platform during a survey on Ostrich Bay. The sensor platform is submerged about 7 ft below the surface.

The tow vessel is a 30-foot triple pontoon boat manufactured by Crest, Figure 2-2. This is the maximum width boat that can be transported over the road without special wide load permits. A 175-horsepower outboard engine was chosen for propulsion. We had most of the furniture stripped from the deck and the deck railings removed on the forward half of the boat so that the sensor platform could be stored and transported on the deck. A marine winch was installed on the deck to lift and deploy the sensor platform. Marine hardware was installed to serve as tie-downs for the instrument racks and the generator. Mounting fixtures were designed and built for the tow point fixture, the GPS antennas, the depth sounder, and the imaging sonar.

Figure 2-2. The tow point fixture is located at the rear of the boat. The master GPS antenna is located on the mast above this point. The digital angular encoder measures the angle of the tow cable relative to the boat heading. The weak link cable is located between the shackles at the end of the tow arm.

The sensor platform is towed by a 16- or 22 m cable attached to a custom tow point fixture located at the center of the boat at the stern, Figure 2-2. The maximum operational design speed is 5 kt. Assuming the system is used to survey 4 m wide lanes at 5 kt, the survey production rate is 3.7+ hectares/hour, or slightly less than 10 acres/hour. The attitude and depth of the sensor platform is controlled by an autopilot operating from a computer on the tow vessel, Figure 2-3. The inputs to the autopilot include a tactical-grade IMU mounted on the sensor platform (determining pitch, roll, and yaw of the platform), depth sensors and digital magnetic compasses on both the platform and on the tow vessel, and a dual antenna GPS system on the tow vessel. The autopilot, which controls the

sensor platform, can be programmed to either maintain a fixed standoff distance from the bottom or to maintain a fixed depth below the water surface.

Figure 2-3. All sensor data are recorded by the computers in these data racks mounted across from the drive console, near the port rail.

The survey products include digitally geo-referenced magnetic anomaly maps of metallic objects buried in the bottom sediments. The full array of dipole-based target analysis capabilities developed for the MTADS ground survey systems has been adapted for this application.

The number of different types of sensors operating and the complexity of the data streams far exceed any of the previously-developed MTADS arrays. This requires that we have multiple computer systems on board, multiple data racks to accommodate them, and the full-time attention of a technician to monitor the data flow, Figure 2-3. The survey plan and the real time survey course are displayed on the Pilot Guidance display shown immediately to the right of the steering wheel in Figure 2-4. The Lowrance sonar display is shown to the left of the steering wheel.

Figure 2-4. The tow vessel console is located on the starboard side. The pilot is responsible for maintaining the survey course and avoiding bottom obstacles.

The primary DAQ computer operates a version of the Geometrics Maglog® software adapted for this application. Maglog has been the primary DAQ GUI for all prior MTADS platforms. The sensors from the marine platform, except the EM68, are recorded in this utility. Additionally, the GPS data and data from the depth sounder are recorded using this GUI.

A new GUI was developed to allow us to control and monitor the sensor platform behavior.[5,6] Three primary operational control algorithms were developed for the sensor platform GUI. The first allows us to operate the platform at an operator-specified depth below the surface. The second mode is designed to operate the sensor platform at a specified height above the bottom. The third mode is referred to as the Emergency Rise mode. This can either be called from the keyboard or automatically invoked by pressing the red Emergency Rise Button on the electronics rack console panel, Figure 2-3. In this mode, the elevators are driven to their full up stops and held there until the platform ascends to 0.5 m below the surface. This mode is intended for use if we observe a bottom obstruction that is likely to cause an impact with the sensor platform.

The sensor platform is a 5 m wide fiberglass structure, which basically has an airplane wing cross-section. Figure 2-5 shows an image of the entire structure floating in the water beside the pontoon boat. Figure 2-6 shows another image with the hatch covers removed. In this image several of the sensor components are identified. The sensor platform accommodates 8 Cs vapor full field magnetometers on a 0.6 m spacing and an EM array consisting of a 1 X 4.5 m transmit coil and four 0.5 X 1 m receiver coils.

Figure 2-5. The assembled sensor platform is shown floating beside the tow boat.

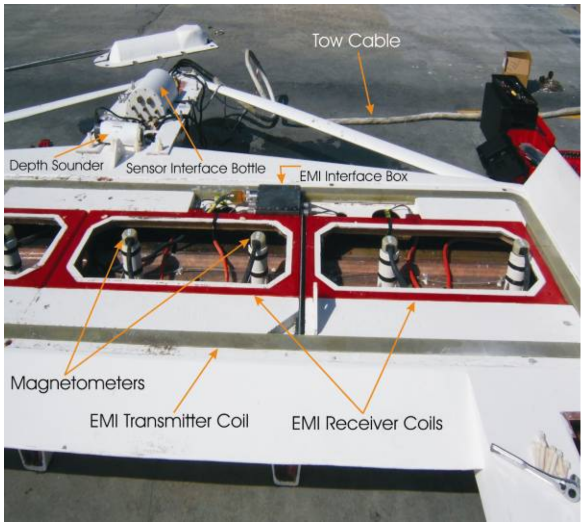

Figure 2-6. The marine sensor platform is shown with the hatch covers removed. Many of the system components are identified.

In case of a severe impact of the platform with some bottom structure, we have designed and installed a breakaway link in the tow cable, which parts at 1,100 lb tension. It is shown in Figure 2-7. The electrical connectors from the tow cable to the bulkhead connector at the rear of the boat are designed to part at 50 lb.; these cables can be wet re-mated. For the survey in Puerto Rico, we installed a SEAFLEX® rubber hawser between the tow point and the weak link. This hawser damps out much of the force in the tow cable related to sea conditions, and reduces the down time during surveying because of breaking of weak links.

Figure 2-7. The weak link cable and the SEAFLEX® hawser are located between the shackles at the end of the tow arm.

To survey near shore areas, we use an array of three 882 magnetometers mounted in the bottom of a flat bottom fiberglass boat. Using plywood, dimensional lumber, and brass or silicon-bronze screws, we constructed a jig to hold the magnetometers and GPS sensors. A similar setup was used during the demonstration in Duck, NC[4] and Vieques Island, Puerto Rico, Figures 2-8 and 2-9. This method was successfully used to survey areas where this boat can navigate near the shore in areas which are inaccessible to the MTA platform.

Figure 2-8: The 3 magnetometer array is shown installed in the skiff survey boat.

Figure 2-9: The flat bottomed survey vessel is shown with GPS, data acquisition and pilot guidance computers installed.

2.2 Technology Development

The technology development was described in detail in the report of our initial demonstration, “The Marine Towed Array Technology Demonstration at the Former Naval Duck Target Facility.”[2] We briefly summarize this information below.

The MTA system concept was developed in conjunction with Vehicle Control Technologies, Inc. (VCT) in SERDP Project UX-1322. We considered a wide range of platform design concepts, and evaluated their potential performance against the top-level requirements in both static and dynamic hydro-code modeling studies. Design concepts included bottom-following platforms (sleds or roller designs), towed submerged platforms (with solid booms or flexible cables), and hybrid platforms dynamically suspended from a towed pontoon platform.

The preliminary design resulting from the concept study was a wing-shaped fiberglass structure designed to be towed from a position well forward of the wing using a flexible tow cable, Figure 2-10. Pitch stability is provided by the (yellow) wing extensions. Weighted skids on the bottom of the platform provide stability to ward off inevitable bottom collisions. Roll and depth control are provided by the elevators (red) on the trailing edge of the wing extensions. The elevators are controlled by two actuators (gray).

The concept design is shown in Figure 2-10. Below we include the general descriptions of the positioning sensors that are required to derive the coordinates of the individual sensors. The precise descriptions of the different positioning sensors are discussed in various SERDP project reports and in the Project Final Report.[6] The most sensitive measurement that must be made is the angle that the tow cable forms relative to the long dimension of the tow vessel, ψ_c, in Figure 2-11. The contributions to the complete sensor positioning error budget were treated in a separate study, which was continually refined as the individual component choices were made and their performances evaluated. At the end of the SERDP Project, it was our prediction that we would be able to locate the sensor positions in the horizontal plane to <15 cm and in the vertical plane to <20 cm using this design.

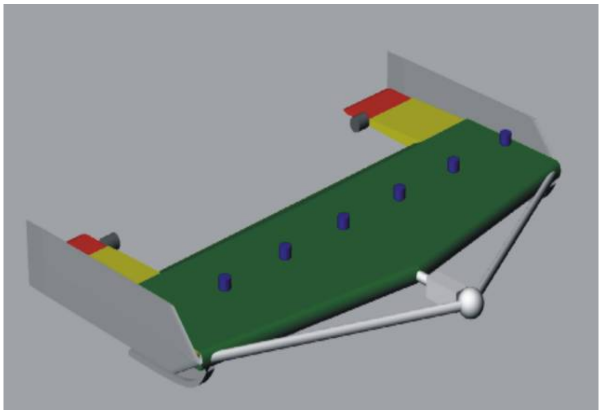

Figure 2-10. Perspective drawing of the 4-meter sensor platform concept.

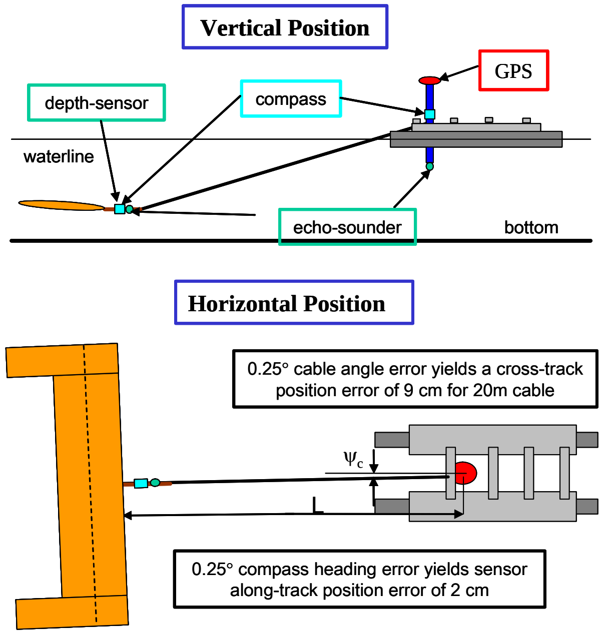

Figure 2-11. Sensor platform deployment concept resulting from SERDP Project UX-1322.

The majority of the actual development work on the Marine Towed Array took place during the ESTCP Project MM2003-24.[7] Structural Composites, Inc. (SCI) joined the effort at the beginning of the ESTCP project. Working with the sensor platform concept designs and the results of the system hydrodynamic performance modeling, we developed a preliminary engineering design. This design was submitted to a Finite Element Analysis to validate the predicted system performance and the planned system design. Following the final system design review, SCI was contracted to produce the sensor platform.

We contracted with a separate firm, Ocean Marine Industries, to design the cable system for towing the sensor platform and to design the sensor interface container. The latter component is a waterproof cylinder that mounts on the sensor platform. Using underwater connectors, this unit serves as a bulkhead interface, mating all of the sensor leads on the sensor platform to the tow cable electrical input connectors. In addition, this container houses a magnetic compass, the Honeywell IMU, and some printed circuit amplifier boards.

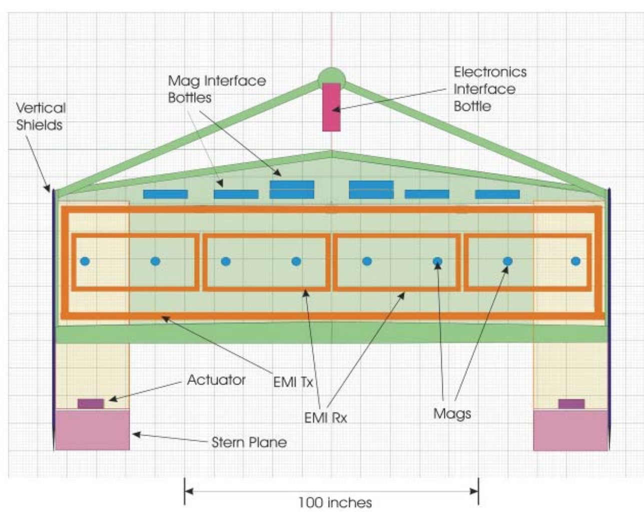

Figure 2-12. Schematic drawing of the marine sensor platform.

Figure 2-12 shows a CAD drawing of the engineering design plan approved for Structural Composites to fabricate. To improve the sensitivity of the EMI system, the receiver coils were increased in size to a full 1-meter in width.

2.3 Advantages and Limitations of the Technology

The MTA system offers the first efficient and automated modern UXO survey capability that can provide fully geo-referenced survey products to support shallow water UXO clearance operations. As it is constructed, the Marine Towed Array is a very complex R&D system. As it is currently configured, it is likely too electronically complex, too heavy, and too expensive to be a commercial instrument in an environment that has other technological competitors. However, we have learned enough from its design, performance, and operation to design a field-worthy prototype that would likely weigh 60-70% less, be self-contained, and be transportable on a single boat trailer.

Mechanically, we currently recognize two shortcomings of the system. It requires the use of an improved boat launch ramp to deploy and recover. In many marine areas this is a problem. Because of the way the Sound is used in Duck, it was a significant challenge during our first demonstration.[2] Because suitable facilities were not available, initially 2-3 hours of survey time was lost each day deploying and recovering the system. Very shallow water access and egress from marinas is an additional problem, as is very narrow access and turning requirements that are not compatible with the MTA with the sensor platform deployed.

A similar situation pertained in the second demonstration at Ostrich Bay. The closest marina with full capabilities for lifting and launching the MTA vessel with the sensor platform on the deck was in Seattle, 20 miles distant from the survey site. The MTA pontoon boat was launched and driven at high speed to Silverdale where it was mated with the sensor platform. The Silverdale marina has an excellent boat launch ramp and docks; however it is 6 miles distant from the survey site.

We therefore set up mooring buoys in Ostrich Bay adjacent to Pier II where the completely assembled MTA was moored each night. The only way that repairs could be done that required removing the platform from the water was to ferry the system to Silverdale. Several repairs were made in the water from the mooring site in Ostrich Bay using a diver.

As a result of our shakedown studies, we decided that, using our current hoist system on the MTA tow vessel that it is unsafe to launch and recover the sensor platform from the deck of the boat while it is in the water. This situation could be remedied; however, it would require a significant system redesign, which has not been undertaken.

Developing a new attachment on the tow cable permitted us to deploy a 22 meter cable, which allowed significantly extending our surveying capability to deeper waters. We were able to survey all areas in Ostrich Bay by judiciously choosing the correct part of the tide cycle while working in deeper areas.

3.0 PERFORMANCE OBJECTIVES

As stated in Section 1.2, the objective of the MTA survey at the Blossom Point Research Facility was to characterize the former offshore ranges associated with the facility (particularly those in the Potomac River) to determine the types, distributions, and extent of ordnance contamination resulting from the former use of the ranges.

The specific operational and performance objectives associated with the MTA survey were enumerated in tabular form in two tables in the Demonstration Test Plan. These tables are reproduced below for this document with the particular headings specified by the Program Office "Final Report Guidance." Table 3-1 addresses the quantitative performance objectives. Table 3-2 addresses operational and performance goals that we deemed to be of a more qualitative nature. The specific performance metrics that were used to evaluate the objectives in both tables were also discussed in detail in Section 1.2 of this document.

The choice of the demonstration site and the details of the demonstration test design were determined by the ESTCP Program Office. These are discussed in Section 5 of this report. The survey design incorporated a series of parallel transect surveys encompassing all the impact range fans in the Potomac. These were specified in the Demonstration Test Plan. It was also understood that there might be additional transects defined by the Program Office "on-the-fly" during the course of the survey and that there would also likely be an area specified during the operation to be 100% blanket survey covered. These issues are discussed in Section 5.5.

The survey transects were evaluated against a marine chart and were divided into sections with water depths greater and less than 2 m deep. The transects in shallow water were surveyed using the skiff MTA adjunct; deeper areas were surveyed by the MTA. These decisions are addressed in Section 5.3. Skiff adjunct and MTA surveys were carried out simultaneously by dividing the SAIC crew between vessels.

Survey deliverables included data analysis, preparation of target lists, preparation of suggested target investigation lists (dig lists), and support of diver investigations. All these were prepared on the fly during our survey operations. The diver investigations began at approximately the same time as our MTA surveying was completed. The data deliverables are discussed in Section 6.

Survey production loss because of equipment failures and breakdowns was minimal. In no case was more than a half day lost because of breakdowns. Repairs were made from equipment spares, except in one case a part had to be ordered for overnight delivery. Survey began the following day before 10:00 AM. Survey production loss because of weather was slightly more extensive than from equipment problems. On three days less than 4 hours of survey was completed either because of high winds (waves) or heavy rain.

Table 3-1: Quantitative Performance Objectives

Performance Objective	Metric	Data Required	Success Criteria	Results
Magnetometry survey production rates	Measured and reported as hourly and daily survey rates and also fraction of day actually taking survey data	Survey area covered, time to complete survey	6 acres/hr while surveying in the open waters	Accomplished
EM survey production rates	Measured and reported as hourly and daily survey rates and also fraction of day actually taking survey data	Survey area covered, time to complete survey	6 acres/hr while surveying in the open waters	EM survey was not required
Detection of calibration targets	Percent of calibration targets detected	Ability to detect calibration targets	All calibration targets larger than 81 mm mortars will be detected	All calibration targets were detected
Target location accuracies	Average error in position for detected targets	Location of seeded items	± 35 cm, overall when surveying with short cable, ± 60 cm when surveying with long cable	Accomplished
Survey coverage / Missed areas	Measured using course-over-ground plots	Course over ground plots	In areas intended for complete coverage, >95% coverage will be accomplished	This was accomplished using fill in surveys as required.
Depth station keeping	Percent of time maintaining depth	Depth measurement from sonar altimeter	Command depth (or altitude) will be maintained within 0.15 m 95% of the time	This was accomplished.

Table 3-2: Qualitative Performance Objectives

Performance Objective	Metric	Data Required	Success Criteria	Results
Pre-establish necessary support logistics	Time lost during demonstration to correct deficiencies	Production Log Book	No time lost due to logistics	Accomplished
Efficient boat and survey platform deployment and recovery	Time lost at the beginning and end of each day to deploy and secure the system	Production Log Book	Minimal ferry times and time to secure system	Accomplished
Provide system support and communication while at sea	Lost survey time to correct problems	Survey Log	Minimal time lost communicating to chase boat	Accomplished
Provide onshore logistics to support data processing and data products	Timely processing of survey data for quality assurance	Daily survey files, quiet office space for processing	Efficient data processing	Accomplished
Efficient performance and integration of ancillary components	Time lost or survey integrity compromised because of GPS, DIDSON sonar, boat mounted depth sounders, or the pilot guidance system performance	Production Log Book	Minimal equipment breakdowns	Accomplished
Pilot guidance system provides capability to achieve survey goals	Performance evaluated with course-over-ground plots in varying sea states and weather	Production Log Book	Based upon missed areas	Accomplished
Efficient integration of the pilot guidance display, the platform auotpilot, and the data acquisition system	Ability to lay out and survey to a prepared grid, based upon track misregistrations	Production Log Book	Efficient survey production rates	Accomplished
Overnight data preprocessing	Preprocess and correct survey data	Mapped Data Files	Accomplish overnight for QA purposes	Accomplished in all cases
Timely target analysis	Target analyses completed in preparation of reports and to support intrusive ork	Production Log Book	As required to support recovery operations	Analysis and dig list completed on time
Timely preparation of dig lists	Priortized did lists prepared as described in Work Plan	Production Log Book	As required to support recovery operations	Analysis and dig list completed on time

Overall, the survey production goals and objectives were all met with complete success and in a timely manner. Sixteen additional transects (provided by the Program Office/PNNL) were surveyed, as was a blanket survey of more than 80 acres in the center of the survey area.

All survey products were completed in a timely manner, e.g. by the end of the MTA survey operations. In cooperation with the Program Office, the suggested target investigation lists were recast and refined to meet the goals of the program. Additionally, we worked closely with EOTI in support of their diver target investigations.

4.0 SITE DESCRIPTION

4.1 Site Selection

The marine area in the Potomac River offshore from the Blossom Point Research Facility was specified by the ESTCP Program Office for this MTA demonstration. The Adelphi Laboratory Research Center – Blossom Point Research Facility is located on Cedar Point Neck, a peninsula that extends into the Potomac River. The peninsula is bounded on the west side by Nanjemoy Creek and on the south and east by the Potomac River. The facility is about 20 mi south of Washington, DC in suburban Maryland.

4.2 Site History

When the Blossom Point Research Facility was established in 1943, the initial mission of the organization was to support testing of experimental fuzes and fuze components to support WWII operations. The facility ultimately supported fourteen ranges, which were used to fire projectiles, mortars and rockets over the shoreline into the Potomac River and Nanjemoy Creek between 1943 and 1982, Figure 3-1.[5] There have been brief periods of inactivity at the Research Facility during peacetime intervals. An "initial assessment" of the range was conducted in 1976. This assessment indicated that the cost of cleanup would exceed the actual property value, therefore the Army purchased the land outright.

The site was re-activated in 1978 and was absorbed into the network of support facilities during the formation of the Army Research Lab (ARL). Figure 3-1 shows the location and extent of the various range fans that extend from the shoreline of the facility into the Potomac River and Nanjemoy Creek.

The fourteen ranges are identified by their official designations as presented below:

- One 75 mm Projectile Range and one 81 mm Mortar Range (which together are termed the Combined Range Fan);
- A 3.25 in, a 4.25 in, a 4.5 in and a 5 in Rocket Range;
- A 2.75 in Rocket Range;
- A 3.25 in Rocket Range;
- A 20 mm, 30 mm, and 40 mm Projectile Range;
- A 4.2 in Mortar Range;
- Two 4.5 in Rocket Ranges; and
- Four 81 mm Mortar Ranges.

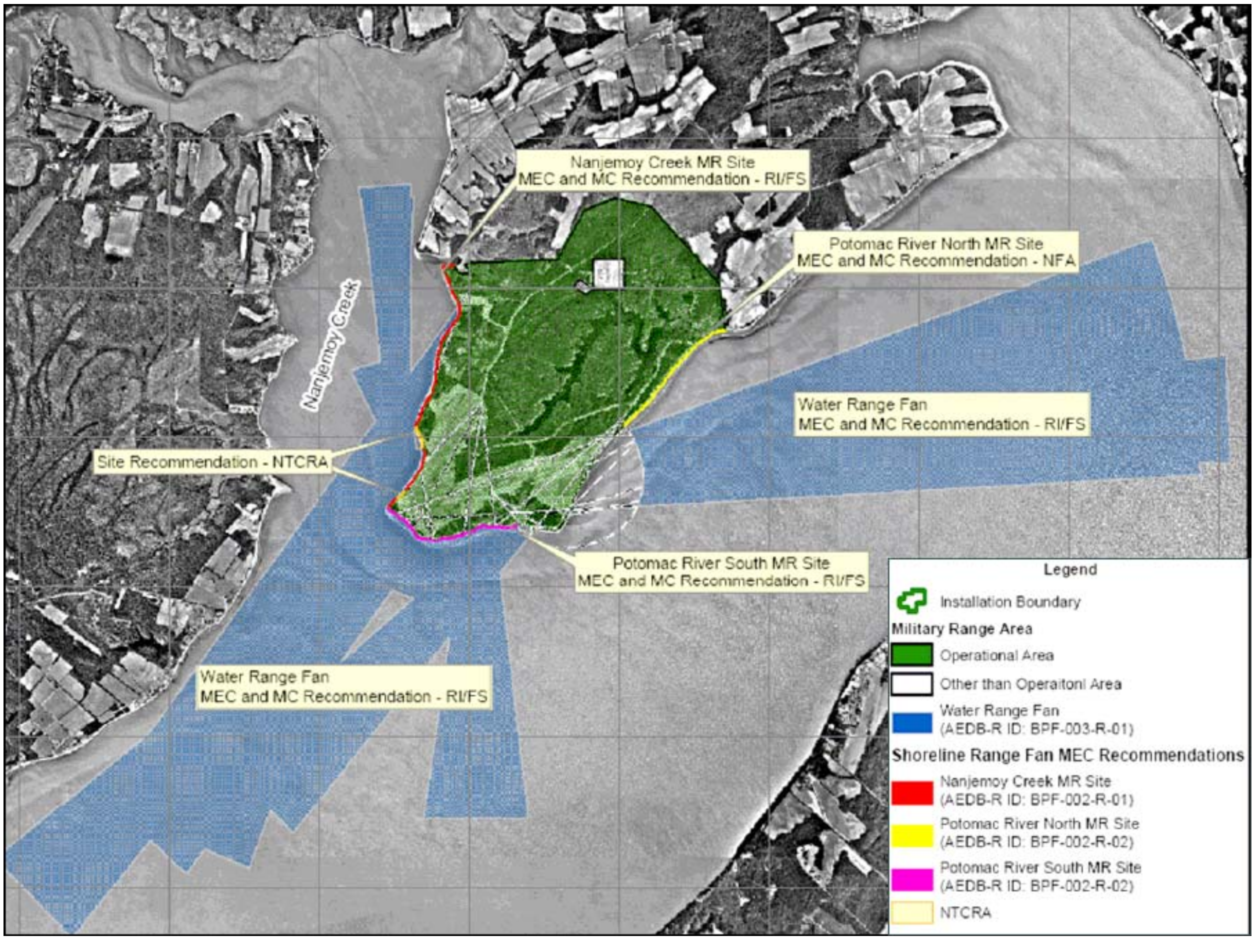

Figure 4-1: The impact areas of the fourteen water range fans that extend into Nanjemoy Creek and the Potomac River are shown in blue.

The munitions known to have been fired on the Water and the Shoreline Range Fans are listed in Table 4-1. The ordnance recovered on this site includes the full spectrum of sizes, ranging from bullets (20 mm projectiles) to bombs (750 lb). The MTA cannot reliably detect the smallest individual projectiles and submunitions. The larger items (mortars, projectiles, and bombs) in the list should be detectable. If groupings of smaller items are clumped together, they will likely also be detectable.

Currently, the majority of the land area on the installation is within operational range areas. The water ranges are no longer active. Two Military Munitions Response Program (MMRP) sites, the Water Range Fan, and the Shoreline Range Fan, exist at the site. Both of these sites are designated as transferred ranges under MMRP. The Water Range Fan was proposed as the focus area for the Unexploded Ordnance (UXO) Innovative Technology Transfer Program.[11]

Table 4-1. Ordnance fired at the Blossom Point Research Facility

2.75" rockets
3.25” rockets
3.5” rockets
4.5” rockets
5” rockets
60-mm mortars
81-mm mortars
4.2” mortars
20-mm projectiles
30-mm projectiles
40-mm projectiles
75-mm projectiles
105-mm projectiles
20- to 750-pound bombs
Small arms

4.3 Site Geology

The geology of the Potomac River adjacent to the Field Research Facility is dominated by man-made artifacts and an eroding shoreline, which is either marginally protected or unprotected by natural vegetation. The shoreline tends to be sculpted by river flooding following springtime thaws far upstream. During the summer and fall, except after widespread thunder storms far upstream, the overall Potomac water depths are at a minimum because of low rainfall activity. Water currents in the river are very complex; they vary with position relative to the channel, the depth below the surface, and the period of the tidal cycle. Currents in some places and at some water depths, often flow upstream depending on the tide. We observed surface downstream currents of up to 4 or 5 knots near the channel near bends in the river and during outgoing tide.

The river is dredged occasionally to maintain a 30 ft navigation channel. The measured water depths in the river include very abrupt depth changes, which have resulted from previous dredging of the channel and deposition of dredge spoils. At a few spots, the water depths in the channel are up to ~100 ft. Water depths adjacent to the channel vary widely and may abruptly change by up to 20 ft where submerged dredge spoils have been deposited.

These conditions required us to buy and install an additional sonar system for the boat driver to monitor these depth changes and to try to adjust the platform depth to avoid bottom collisions during survey. Ultimately, collisions with an abruptly rising bottom could only be avoided by either shifting the boat into neutral allowing the platform to rise to the surface, or to abruptly turn right or left to avoid the dredge spoils.

The bottom sediments vary from extremely soft muck that may be several ft deep, to soft or hard sand; deeper parts of the river also include areas with a hard packed surfaces. Over the past few years invasive sea grass (hydrilla) has begun to dominate many areas of the river. Because of low water visibility, the hydrilla is concentrated in shallower areas. The prevalence of the vegetation also varies with the time of the year. During our operations, we did not encounter any marine vegetation in the survey areas.

Figure 4-2. Floats from crab pots dominated the entire survey area except in the river channel.

Many commercial crab fishermen work all the Potomac River areas, except the shipping channel where they are forbidden to operate. The MTA survey took place near the end of the crab season, but there were still

thousands of crab pots in the survey area, Figure 4-2. In the transect survey areas we just drove around them, in the blanket survey area they created small missed areas. In data analysis we learned to identify fully intact crab traps; however, pieces and parts of disintegrating traps were sometimes mistaken as possible ordnance.

5.0 TEST DESIGN

The ESTCP Program Office established the MTA Demonstration Test Design. It is described in detail in Chapter 3 of the Demonstration Test Plan. The Program Office provided a set of survey transects as guidance for the survey operations. These were set up on a 125 m spacing and designed to cover the entire offshore range fan impact areas in the Potomac River. The transects are shown in Figure 5-1 overlaid on a NOAA marine chart. The direction provided was that the survey approach was to start mapping from the Blossom Point shoreline and proceed away from the shoreline covering all the odd numbered transects. Following completion of these transects, the Program Office was to provide guidance to (1) either survey the other half of the transect lines, (2) conduct some combination of blanket area surveys and the remaining transects, (3) survey new transects to be provided by the Program Office, or (4) some combination of the above. The total area of the bounded region is approximately 9,500 acres. The 125 m transect spacing, if all transects are surveyed covers a total of ~4% of the bounded site.

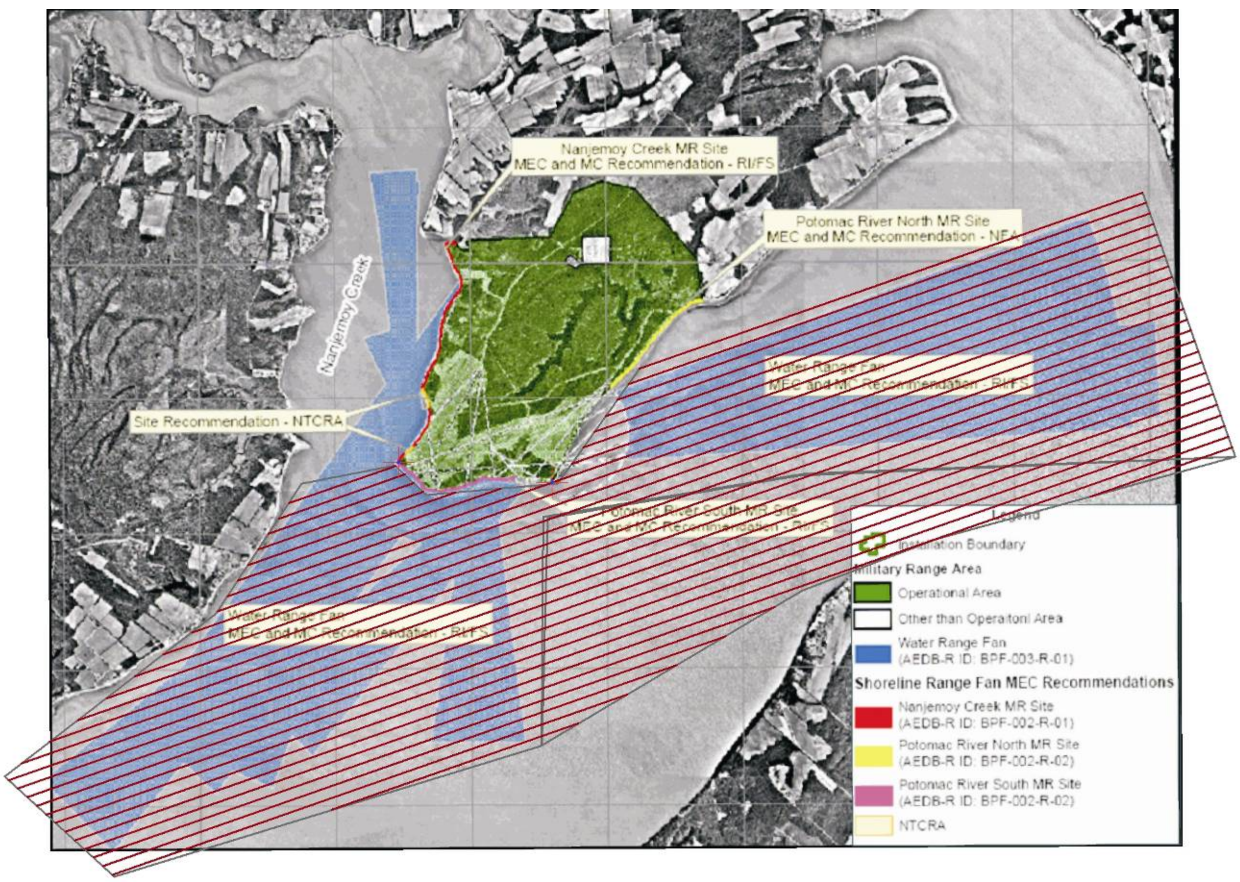

Figure 5-1. Survey Area in the Potomac River showing the proposed survey transects.

5.1 Conceptual Experimental Design

The demonstration plan called for the MTA magnetometer array to survey areas with water depths between 5 and 35 ft. Shallow areas (less than 6 ft deep) were to be surveyed using a magnetometer array in SAIC's flat-bottomed skiff (the MTA Adjunct). Some areas were covered using both platforms.

The intent of our demonstration was to:

- Use the MTA to survey the Calibration Line and present the results to the Program Office showing that the MTA was operating within its design parameters,
- Use the MTA to conduct an efficient and comprehensive survey of the potentially MEC-contaminated areas of the Potomac River (described above and as further directed by the Program Office), and
- Process and analyze the survey data and reduce it to a prioritized target list appropriate to support diver investigations.

SAIC conducted a site visit prior to the survey to establish and confirm logistics for mobilization and survey operations. There are no support facilities for boats or boat launching on the Blossom Point Field Research Facility. The nearest appropriate marine facilities are located at the Goose Bay Marina about 1 mi away from the east end of the survey transects shown in Figure 5-1.

In preparation for the demonstration, all equipment was transported from the SAIC Cary office to the Blossom Point Research Facility. We rented a box truck and an SUV both with trailer hitches. The equipment required for the survey operation, as well as all spares, were transported in the box truck. The box truck also served as a secure storage facility for MTA equipment during field operations. The sensor platform was towed by the box truck; the SUV towed the pontoon boat. The sensor platform was assembled and launched at the Goose Bay Marina,[12] which is located on Goose Creek northeast of the Water Range Fan. Two adjacent slips were rented at the marina to accommodate the MTA boat and sensor platform. A chase boat was rented locally and operated by a subcontractor. The chase boat was launched and recovered each day from the launch slip at the marina. It was parked overnight in the large boat storage area at the marina.

5.2 Site Preparation

We subcontracted with EOTI to perform a two-day geophysical investigation of the offshore areas in the Potomac River near Blossom Point before completing our Demonstration Test Plan.

The primary purposes of the EOTI preliminary geophysical investigation were to:

- determine bottom (sediment) conditions and verify whether it was feasible to recover ordnance targets,
- make spot bathymetric measurements to verify the validity of the information from the ten-year old NOAA marine chart, which reports water depths in the near shore areas,
- verify the validity of the abrupt bottom changing conditions along the starboard side of the River channel, which have resulted from dredging of the channel, and
- determine the presence of and map out the general extent of sea grass within the planned survey areas. It would have be impossible to operate the MTA in the presence of dense sea grass.

EOTI provided a report to SAIC describing the results of their investigation. These results were incorporated into the final version of our Demonstration Test Plan.

Other than our exploratory visit to the site, which is described in the previous section no other presurvey activities were conducted before the survey began. Neither of these activities actually involved any preparation of or modification of the demonstration survey site. Neither the Army Research Laboratory or their contractors carried out any activities that modified or prepared the marine areas for our activities.

Figure 5-2. An orange stake (with an orange painted circle around it) denoted the GPS Control Point. The image is looking westward toward the Potomac River Survey Area.

GPS Control Point

The primary GPS control point for this demonstration was a preexisting point established by the Army Research Laboratory. The coordinates are cited from the information binder located in the "School House." The School House is a building rented by NRL on the Field Research Facility. The Control Point is located adjacent to the School House and is nearly line-of-sight visible to the entire survey area, see Figure 5-2. The provided coordinates for the Control Point were:

Lat 38.408770947
Lon -77.109274265

We used this control point for all our survey activities. Using our radio installed on our highest mast, there were no GPS drop outs on the survey area shown in Figure 5-1. Radio contact was immediately lost, however leaving the east end of the survey site in the direction of Goose Bay.

5.3 System Specification

We recorded all relevant data strings from the GPS antennas mounted at the bow and stern of the MTA tow vessel and the skiff adjunct. Maglog© was used to record the angular encoder information that determines the angle between the GPS antennas and the MTA tow cable. High-precision depth readings from the tow vessel and the sensor platform were recorded, as are the digital magnetic compass readings from compasses on the tow vessel and on the sensor platform. Data from the eight magnetometers (with a 0.6 m spacing) are recorded at 20 Hz. All output data from the IMU are recorded (positions, velocities, and accelerations, measuring platform pitch, roll, and yaw). All autopilot information (commands and calculated variables) are recorded by the autopilot computer. The pilot navigation computer measures the course-over-ground (water) and provides the real-time output survey image for comparison with the planned survey course. Both this information and the water depth are displayed in real time to the boat driver.

All data preprocessing and cleanup was carried out using the Oasis montaj© suite of programs. Filtering was applied (as with all other MTADS data) to remove long term sensor drifts, to null the zero levels of the magnetometers against each other, to remove (as appropriate) geological interferences, and to smooth electronic interferences. The only currently-identified electronic noise is that from the actuator control cables. These occur primarily at 15 Hz and are typically measured to be 0.1-0.2 nT in the extreme port and starboard magnetometer data. These noise sources are apparent only on the two outboard sensors, which lie closest to the actuator cables.

Fully-corrected mapped data files are the output of the Oasis montaj processing steps described above. The default target analysis GUI is the MTADS DAS that has been specially adapted for both the magnetometer and EMI data. The MTADS DAS is compatible with the Oasis mapped data files described above.

Following target analysis of the magnetometer data, complete target lists were prepared, as described earlier in this document. The target lists were down-selected to provide a recommended list of targets for diver investigation (the Dig List). As with all target reports and dig lists, the analysis reports generated with this project contain a description of each target including all fitting parameters and the analyst's observations and comments. Because the range of ordnance sizes on the site fairly continuously covers the size scale from 0.02 lbs to 500 lbs, the predicted target size from our target analyses were of little value in differentiating between ordnance and non-ordnance.

5.4 Calibration Activities

Most of the components of the MTA are self calibrating, e.g. their output is based upon digital counting of frequencies, internal QC analyses automatically carried out by the GPS components on boot up, etc. All mechanical operational components of the MTA are tested on power up. Internal diagnostic routines are run and presented as displays for each of the

magnetometers during their warm up. Magnetometer output readings are available both digitally and as waterfall displays at all times. If there are noise problems or offset problems associated with the individual units, they area apparent in the displays. There are continual updates from all the sensors on the sensor platform displayed digitally, as are the readouts of the platform altitude, pitch, roll, and yaw. The Pilot Guidance computer displays in real time the system position relative to the planned survey grid, the direction and distance off course, the vessel heading, the water depth (and its rate of change), the distance and predicted time to the end of the current survey line, etc.

A Calibration Target Line was installed before beginning the Blossom Point survey. Calibration targets were composed of pipe sections that approximate the sizes of various ordnance items. A similar group of pipe sections that were installed before our demonstration in Duck is shown in Figure 5-3.

Figure 5-3. A group of pipe sections is shown that mimic the sizes of 60- and 81-mm mortars, a 2.75-in warhead, and a 105-mm projectile.

The line of targets was installed in relatively shallow water near the east end of the survey transects shown in Figure 5-1. This location was chosen so that the calibration targets could be measured with both the skiff and the MTA each survey day on the way to and from the marina. Pipe sections were purchased and cut to match the diameters and lengths of the three larger ordnance items shown in Figure 5-3. We also installed 5 pieces of rebar, and 4 additional sections of galvanized pipe.

A degaussing unit, Figure 5-4 was used to remove remnant moment from the pipe and rebar sections before they were installed, as described below. Used correctly, this instrument completely removes any measurable remnant signal from any steel item that can pass through its aperture.

The locations of the calibration targets were positioned using a line of fiberglass rods, Figure 5-5 **(**planted in the bottom) that extended above the surface. This approach allowed us to accurately locate the pipe and rebar sections using GPS. The pipe sections were buried so that they were flush with the sediment surface, Figure 5-6 and the fiberglass poles were removed after the target locations are acquired.

Figure 5-4. This is the loop demagnetizer that was used degauss the calibration targets.

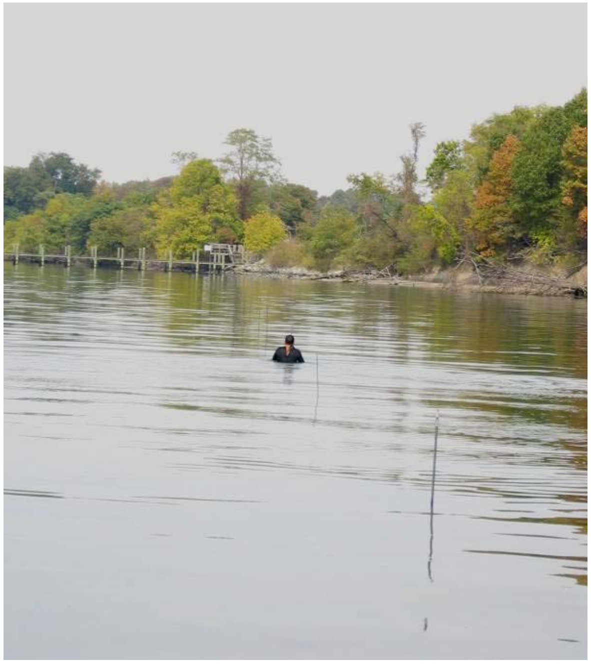

Figure 5-5. The line of fiberglass poles were established to locate the calibration targets.

Figure 5-6. The diver is preparing to install the target adjacent to the pole.

The target identification and positions for the calibration line are given in **Table 5-1.** During the course of survey operation we were never more than a few minutes away from the installed targets that were placed in the calibration line. If any aspect of the operation was in doubt, we could just rerun a pass over the calibration targets.

Figure 5-7 shows a magnetic anomaly image of the calibration target line measured from three survey passes by the MTA. These images are very faithful to the actual target parameters. This is the first time that we have installed a calibration target line using degaussed objects. The measured burial depths and fitted sizes are far superior to similar measurements made on objects with large remnant moments that are characteristic of them before degaussing.

Table 5-1. Calibration Targets With Measured and Fitted Positions

Ground Truth				Fitted Values									Delta X-Y
Targ No.	Target ID	UTM X (m)	UTM Y (m)	HAE (m)	Size (m)	Moment	Incl.	Azi.	Fit	UTM X(m)	UTM Y(m)		
1	Rebar	324739.67	4255521.12	-43.62	0.107	0.672	90	198	0.682	324739.57	4255521.00		0.156
2	Rebar	324743.22	4255510.72	-43.61	0.101	0.559	73	300	0.744	324742.82	4255510.66		0.403
3	Rebar	324747.35	4255497.70	-43.63	0.103	0.599	74	40	0.786	324747.48	4255497.80		0.168
4	Rebar	324752.08	4255483.19	-43.73	0.111	0.740	66	326	0.747	324752.01	4255483.08		0.125
5	Rebar	324755.86	4255471.49	-43.81	0.101	0.557	87	282	0.721	324755.77	4255471.35		0.165
6	Galv Pipe 2 X 24 in	324759.90	4255459.17	-43.74	0.095	0.463	84	263	0.840	324759.73	4255459.07		0.197
7	Galv Pipe 2 X 24 in	324763.40	4255448.39	-43.63	0.111	0.751	17	338	0.790	324763.24	4255448.15		0.291
8	Galv Pipe 2 X 24 in	324767.66	4255435.36	-43.55	0.128	1.130	14	347	0.903	324767.32	4255435.33		0.339
9	Galv Pipe 2 X 24 in	324770.99	4255424.98	-43.60	0.120	0.946	15	340	0.847	324771.27	4255425.05		0.288
10	Pipe (2.75 in)	324775.26	4255412.05	-43.57	0.074	0.219	13	335	0.770	324775.05	4255411.92		0.248
11	Pipe (81mm)	324779.85	4255397.84	-43.65	0.076	0.243	24	359	0.838	324780.21	4255398.01		0.395
12	Pipe (105mm)	324784.93	4255382.50	-43.69	0.121	0.954	20	342	0.828	324785.07	4255382.76		0.295
											Ave Miss Distance		0.256

5.5 Data Collection

The demonstration plan for this survey called for survey of odd numbered 125 m spaced transects to be completed, followed by additional areas of survey coverage to be defined on-the-fly by the Program Office. The daily log of our demonstration operations is shown in Table 5-2. The log of the survey data files is shown in Tables 5-3, 5-4, and 5-5. Table 5-3 is a log of the survey files for the MTA transect and calibration line surveys. Table 5-4 has the details of the MTA blanket survey of the specified 93 acre area that was surveyed on 31 October and 1 November. Table 5-5 contains the log of the skiff surveys of the near-shore areas of several transects, a shoreline area, and the calibration line surveys. In Tables 5-3, 5-4, and 5-5 “16m TC” (and “22m TC”) refer to the length of the tow cable deployed for the particular survey.

A total of about 375 line km of surveys were completed by the MTA system, including both the transect and blanket area surveys. This translates to ~450 acres of MTA survey. These data were collected during approximately 56.7 survey hours, based upon the length of the edited survey data files. This corresponds to an MTA survey production rate of 7.95 acres/survey hour.

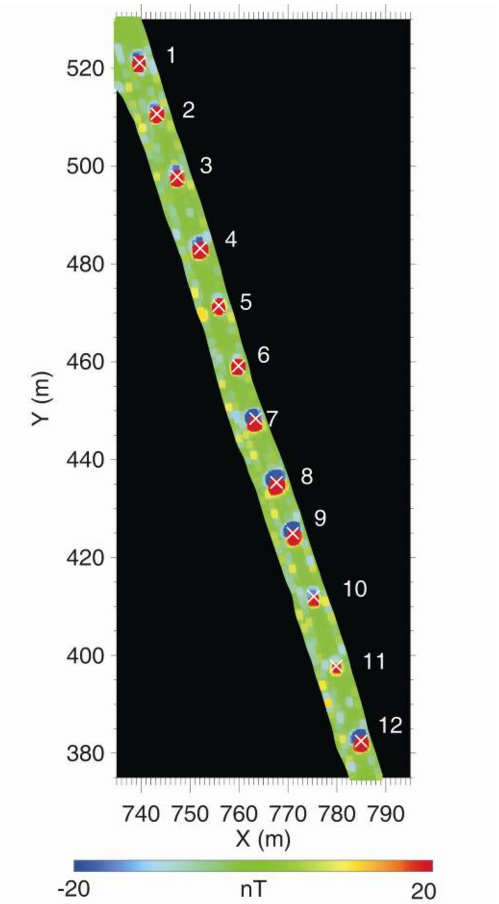

Figure 5-7. This is a magnetic anomaly image of the targets in the Calibration Line from a 3-pass survey made by the MTA.

The skiff survey system completed 52 line km of surveys during 10.6 hr of survey. Based upon the 2 m array width, this corresponds to 25.6 acres of survey.

5.6 Validation

The data processing, analysis, classification, and preparation of data products are described in Section 6. All the valid targets in the MTA transect data and the skiff data were analyzed. Targets were selectively analyzed from the blanket survey. A compiled target list of 692 targets from all the survey data was completed and a recommended target list for investigation based upon target classification/ranking was presented to the Program Office. From the recommended dig lists of targets submitted by SAIC, the Program Office selected a group of 142 targets for investigation. These included 59 targets from the transect MTA survey, 25 targets from the MTA blanket survey, and 27 targets from the skiff survey.

Table 5-2. Blossom Point Survey Operations Log

Date	Operation	Result
Fri 12 Oct 2007	Mobilization	Rent Vehicles Pack Out Vehicles
Mon 15 Oct	Mobilization	Jim, Chris, Chet Drive Vehicles to Goose Bay Marina
		Nagi Arrives from Illinois
		Nelson Arrives with Chase Boat
		Pontoon Boat Launched & Parked in Slip
Tue 16 Oct	Mobilization	Install Calibration Line
		Repair Platform Components
		Assemble and Launch Platform
Wed 17 Oct	MTA Survey	Repair DAQ Computer
		Survey Calibration Line
		Survey 2 Transects
Thu 18 Oct	MTA Survey	Survey 6 Transects and the Calibration Line
Fri 19 Oct	MTA Survey	Survey 1 Transect, Stopped by Heavy Rain
		McD Analyzing Data, Chris to NC to pick up skiff
Sat 20 Oct	MTA Survey	Survey 3 Transects, Crash on Submerged Wreck
		Replace Broken Cowcatcher, Rewire Actuator Cables
Sun 21 Oct	MTA Survey	Survey All Odd Numbered Short West-side Transects
		Survey Calibration Line
Mon 22 Oct	MTA Survey	Repair Engine Water Pump
		Surveyed 5 East End Transects (23 Transects Completed)
		Chris Returns with New Skiff
Tue 23 Oct	Skiff Buildout	Chris & Chet Buildout Skiff for Surveying
		Jim & Nagi Data Prep. Analyzed Targets from 8 Transects and Created Target Tables
Wed 24 Oct	MTA Survey and Skiff Buildout	Survey 5 Short Lines
		Rain/Wind Force MTA Back to Marina at 1000
		Skiff Buildout Continues, Target Analysis Continues
Thu 25 Oct	Skiff Buildout	Skiff Buildout Continues, Target Analysis Continues
Fri 26 Oct	"Show & Tell"	Onsite Demo for Program Office and Guests
Sat 27 Oct	Rest Day	
Sun 28 Oct	MTA Survey	Survey 1 Short Line, Weather Forced MTA Back to Marina
Mon 29 Oct	Skiff Survey	Chris & Nagi Complete Full Day of Skiff Transects
	MTA Survey	Jim & Chet MTA Survey of Long Lines on Va Side of Channel
		Surveyed New PNNL N/S Transects on East Side
		All MTA Surveys Completed on East Side
Tue 30 Oct	Skiff Survey	Chris Completed all Skiff Transects, Nagi to Home
	MTA Survey	All Original and PNNL Transects Completed
		Blanket Survey Setup and Programmed for MTA Survey
		Blanket Survey Area Defined, 250 X 1500 m
Wed 31 Oct	MTA Survey	Chris and Chet Survey 30 Blanket Area lines Target Analysis Continues, Skiff Data Workup Started
Thu 1 Nov	MTA Survey	Chris & Chet Complete Last 30 Acres of Blanket Area
		Transect Target Analysis Completed, Target Lists Submitted
		Blanket Area Processing Begins
	Demobilization	Boats Pulled from Water, Cleanup Begins
Fri 2 Nov	Demobilization	Equipment Disassembled and Packed Out
Sat 3 Nov	Demobilization	Equipment Returned to Cary
Mon 5 Nov	Demobilization	Equipment Unpacked and Returned to Inventory
	Demobilization	Rental Vehicles Returned
Wed 7 Nov	Survey Products	All Data Analysis Completed, Data Products Delivered to the Program Office

Table 5-3. Survey Data Log for the MTA Transect and Calibration Line Surveys

Date	File Name	16m TC	Transect	Time (hr)	Distance (km)	Comments
17-Oct	BP1	✓	13	1.35	7.18	
	BP2	✓	9	1.27	6.85	
	Cal1	✓	N/A	N/A	N/A	Cal line south; aborted, too shallow
	Cal2	✓	N/A	N/A	N/A	Cal line surveyed in S & N directions
18-Oct	Cal3	✓	N/A	N/A	N/A	3 passes – S, N & S
	BP3	✓	5	0.89	6.30	
	BP4	✓	1	1.02	5.84	
	BP5	✓	15 (E part)	0.94	7.04	
	BP6	✓	17 (E part)	1.01	6.77	
	BP7	✓	19	2.34	13.34	
	BP8	✓	21	1.96	13.95	
	Cal4	✓	N/A	N/A	N/A	N survey
19-Oct	Cal5	✓	N/A	N/A	N/A	S survey
	BP9	✓	23	1.75	12.16	Incomplete due to heavy rain
20-Oct	Cal6	✓	N/A	2.08	14.09	S survey
	BP10	✓	29	0.79	5.43	
	BP11	✓	36	0.82	6.42	
			34	N/A	N/A	Crash – possibly shipwreck
21-Oct	Cal7	✓	N/A	N/A	N/A	S survey (poor coverage)
	BP12		32	N/A	N/A	Fatal GPS glitch (redo later)
			34	1.00	6.61	
	BP14		31	1.19	8.29	
			27 (W part)	1.05	6.20	
	BP15		25 (W part)	0.55	4.12	
	BP16		17 (W part)	0.44	3.13	
			15 (W part)	1.10	7.52	
	BP17		20 (E part)	1.00	6.61	
	Cal8	✓	N/A	N/A	N/A	N survey (poor coverage)
22-Oct	BP18		3	0.88	6.10	
			7	0.86	6.16	
	BP19		11	0.90	6.52	
			14 (E part)	0.91	6.53	
	BP20		16 (E part)	0.83	6.51	
	BP21		14 (W part)	0.30	2.22	
			16 (W part)	0.44	3.06	
	BP22		18 (W part)	0.69	4.78	
	BP23		20 (W part)	0.84	5.31	
			18 (E part)	0.83	6.56	
24-Oct	BP24		24 (E part)	0.30	2.08	
			25 (E part)	0.29	2.03	
			26 (E part)	0.28	1.77	
	BP25		27 (E part)	0.27	1.78	High winds, rain & white caps
28-Oct	BP26		28 (E part)	0.27	1.53	2 ft waves, whitecaps, wind gusts of 20-30
	BP27		30 (E part)	0.18	1.25	
			32	0.20	1.41	
	BP28		22	2.01	14.25	
	BP29		24(W part)	0.89	6.55	
	BP30		26(W part)	1.17	6.57	
	BP31		28(W part)	1.35	9.72	
	BP32		NE2-NE8	1.15	7.83	
30-Oct	BP33		30 (W part)	1.20	7.41	
	BP34		33	0.80	5.52	
	BP35		35	0.75	5.02	
	BP36		SW4-SW7	1.50	10.24	
	BP37		SW3	0.40	2.23	Abort due to platform rolling over
Total MTA Transect Survey Time (hr)				**42.99**		
Total MTA Transect Survey Distance (km)					**288.79**	

Table 5-4. Blossom Point MTA Blanket Magnetometry Survey Log

Date	File Name	22m TC	Transect	Time (hr)	Distance (km)	Comments
31-Oct	BP38	✓	N/A	1.12	6.63	
	BP39	✓	N/A	1.06	6.86	
	BP40	✓	N/A	1.06	6.56	
	BP41	✓	N/A	1.10	6.53	
	BP42	✓	N/A	1.09	6.45	
	BP43	✓	N/A	1.12	6.54	
	BP44	✓	N/A	1.03	6.54	
	BP45	✓	N/A	0.52	3.20	
1-Nov	BP46	✓	N/A	1.10	7.04	
	BP47	✓	N/A	1.00	6.53	
	BP48	✓	N/A	0.98	6.56	
	BP49	✓	N/A	0.99	6.69	
	BP50	✓	N/A	1.51	9.86	
Total MTA Blanket Survey Time (hr)				**13.69**		
Total MTA Blanket Survey Distance (km)					**86.00**	

Table 5-5. MTA Adjunct (Skiff) Magnetometry Survey Data Log

Date	File Name	16m TC	Transect	Time (hr)	Distance (km)	Comments
28-Oct	Cals3	N/A	N/A	N/A	N/A	Cal line surveyed with Skiff
	Cals4	N/A	N/A	N/A	N/A	Cal line surveyed with Skiff
	BPs3	N/A	2	0.42	2.45	Skiff Survey
		N/A	4	0.46	2.62	
	BPs4	N/A	6	0.82	3.17	Skiff Survey
	BPs5	N/A	8	0.53	3.42	Skiff Survey
		N/A	10	0.63	3.95	
	BPs6	N/A	12	0.83	5.15	Skiff Survey
		N/A	14 E fill-in	0.30	1.70	East of point
	BPs7	N/A	15, 16 fill-in	1.19	6.92	Skiff Survey
30-Oct	Cals5	N/A	N/A		N/A	
	BPs11	N/A	NE9	0.30	1.27	
	BPs12	N/A	14 W fill-in	0.60	2.20	West of point
	BPs13	N/A	9,11,13 fill-ins	0.70	2.38	
	BPs14	N/A	5,7 fill-ins		1.68	
	BPs15	N/A	1,3 fill-ins	0.65	1.54	
	BPs16	N/A	Shallow area		3.81	Two lines near shore (N of 1)
	BPs17	N/A	Shoreline	1.00	2.96	All along the point
	BPs18	N/A	SW1-SW3 fill-in	1.00	3.64	
	BPs19	N/A	SW4-SW7 fill-in	1.20	3.26	
Total Skiff Survey Time (hr)				**10.63**		
Total Skiff Survey Distance (km)					**52.12**	

Under separate contract, the selected targets were investigated by divers working with EOTI. The results of the target investigations are presented in Table 5-6. The investigated targets included 50 items classified as MEC or MEC components by the divers, 49 items described as non-MEC, and a dozen targets that were described as "no finds" or as too deep to recover. Among the non-MEC recoveries were several boat anchors and 21 targets described as crab pots (or parts of crab pots).

Table 5-6. Results of the Diver Investigations

	Predicted Location		Reacquired Location		Water Depth	Size		Burial Depth		Class	Weight	Diver Description
ID	UTM X	UTM Y	UTM X	UTM Y	(m)	Predicted (m)	Actual (m)	Predicted (m)	Actual (in)			
Tr 3-7	322425.31	4255632.05	322425.31	4255632.06	3.07	0.257	0.610	-0.17	0	Non-MEC	10 lbs	crab pot
Tr 3-8	323695.56	4256079.72	323695.55	4256079.71	3.37	0.195	0.610	0.40	8	Non-MEC	10 lbs	crab pot - Not recovered
Tr 5-12	321962.53	4255341.15	321962.53	4255341.16	2.8	0.198	0.610	0.62	0	Non-MEC	na	crab pot left in place
Tr 5-15	323661.34	4255937.31	323661.34	4255937.31	3.4	0.267	0.610	0.63	0	Non-MEC	20 lbs	crab pot
Tr 7-31	322053.51	4255240.59	322053.51	4255240.59	2.77	0.228	0.152	0.08	10	Non-MEC	1 lb	soda can / wire
Tr1-5	321830.78	4255554.52	321830.78	4255554.52	2.8	0.083	na	0.38	na	na	na	nothing found
Tr 5-13	323372.08	4255833.71	323372.08	4255833.71	3.4	0.148	0.070	0.43	0	Non-MEC	2 oz	1 in. squares of wire
Tr 7-33	322164.55	4255279.12	322164.55	4255279.12	2.77	0.083	0.076	0.32	6	MEC	3 oz	20 mm APT
Tr 7-35	323097.94	4255607.14	323097.94	4255607.14	3.27	0.119	0.203	0.15	4	Non-MEC	2 lbs	chicken wire
Tr 7-36	323131.63	4255615.36	323131.63	4255615.36	3.27	0.125	0.356	0.43	3	Non-MEC	1 lb	tongs
Tr 7-1	318403.16	4253968.29	318403.16	4253968.29	2.63	0.146	0.305	0.72	10	MEC Scrap	4 lbs	frag
Tr 7-3	318445.68	4253979.97	318445.68	4253979.97	2.83	0.156	0.305	-0.13	0	Non-MEC	25 lbs	non mec triangular scrap
Tr 9-84	322895.39	4255402.00	322895.39	4255402.00	3.08	0.145	NA	0.45	6	Non-MEC	3 lbs	soda can/ wire scrap pile
Tr 9-86	323004.19	4255437.12	323004.19	4255437.12	3.07	0.100	0.610	0.10	0	Non-Mec	1 lb	crab pot wire
Tr 9-2	318018.85	4253689.21	318018.85	4253689.25	2.56	0.175	0.457	0.25	23	MEC		90 mm with fuze left in place
Tr 11-2	318371.11	4253652.96	318371.12	4253652.99	2.75	0.067	0.305	0.45	4	MEC		75 mm fuzed - Not Recovered
Tr 11-29	322564.05	4255148.29	322646.19	4254119.26	3.06	0.112	na	0.42	na	na	na	nothing found
Tr20-13	322646.19	4254119.23	322646.19	4254119.24	3.42	0.131	1.219	0.19	12	Non-MEC		non mec piece of 1" pipe
Tr 22-26	322846.35	4253944.80	322846.35	4253944.80	3.64	0.09	2.000	0.33	4	Non-MEC		anchor and chain
Tr 11-30	323243.77	4255388.61	323243.77	4255388.61	3.33	0.133	0.914	0.27	0	Non-MEC	3 lbs	chicken wire
Tr 11-31	323395.06	4255435.03	323395.06	4255435.03	3.37	0.082	0.254	0.55	0	Non-MEC	1 lb	10x10in piece of crab pot
Tr 17-20	323219.69	4254717.44	323219.69	4254717.44	3.12	0.132	0.076	0.15	15	MEC	3 oz	20 mm apt
Tr 22-27	323220.98	4254050.44	323220.98	4254050.44	3.37	0.11	0.127	0.29	3	MEC Scrap	3 oz	50 cal case
Tr 15-15	323461.17	4255071.88	323461.17	4255071.88	3.37	0.170	0.152	0.39	8	Non-MEC	4 oz	soda can
Tr 22-28	323584.92	4254184.49	323584.92	4254184.50	3.37	0.11	0.127	0.32	8	Non-MEC	2 oz	soda can
Tr 16-10	323665.25	4255017.95	323665.24	4255017.96	3.57	0.064	0.254	0.04	5	Non-MEC	1 lbs	10 x 10 in chicken wire
Tr 18B-15	323678.67	4254744.80	323678.66	4254744.81	3.37	0.114	0.610	0.08	18	Non-MEC	5 lbs	bottom of crab pot
Tr 15-19	323798.29	4255190.51	323798.29	4255190.51	3.67	0.089	0.610	0.43	0	Non-MEC	1 lb	pieces of chicken wire
Tr 15-21	323899.83	4255216.42	323899.82	4255216.43	3.57	0.120	0.178	0.42	3	Non-MEC	8 oz	7 in long screwdriver
Tr 18B-16	324120.87	4254904.75	324120.88	4254904.75	3.57	0.167	0.305	0.26	4	Non-MEC	2 lbs	pieces of crab pot
Tr 17-22	324121.69	4255030.20	324121.69	4255030.22	3.55	0.120	0.610	0.17	5	Non-MEC	5 lbs	crab pot frame
Tr 18B-17	324318.12	4254970.09	324318.15	4254970.08	3.68	0.163	0.610	0.10	12	Non-MEC	10 lbs	crabpot left in place
Tr 17-17	320808.19	4253878.42	320808.19	4253878.42	5.09	0.062	0.279	-0.13	4	Non-MEC	1 1\2 lbs	non mec scrap
Tr 18B-10	320984.79	4253814.42	320984.78	4253814.44	4.26	0.102	0.203	0.45	8	MEC Scrap	4 lbs	frag
Tr 18B-11	321018.85	4253822.47	321018.86	4253822.47	3.89	0.112	0.127	0.52	7	Non-MEC	1\2 lb	aluminum bar non mec
Tr 18B-12	321024.95	4253825.04	321024.95	4253825.06	3.81	0.108	0.064	0.54	3	MEC Scrap	2 oz	50 cal round
Tr 18B-13	321031.86	4253826.58	321031.83	4253826.58	3.74	0.066	0.203	0.45	7	MEC Scrap	1 lb	frag
Tr 15-11	321498.42	4254381.82	321498.47	4254381.76	3.35	0.136	0.914	0.08	0	Non-MEC	1 lb	1\4 in wireE
Tr20-10	321795.91	4253886.42	321795.89	4253886.48	4.91	0.112	0.864	0.17	1	Non-MEC	12 oz	non mec piece of wire
Tr20-12	322066.91	4253926.31	322066.90	4253926.32	2.53	0.120	0.025	0.17	0	MEC Scrap	6 oz	possible mec found on surface
Tr 34-4	316379.12	4250199.30	316379.12	4250199.30	5.56	0.090	0.102	0.08	0	Non-MEC	4 oz	d-ring from boat
Tr 29-11	316650.21	4250832.39	316650.21	4250832.39	5.62	0.135	0.610	0.67	30	Non-MEC	7 lbs	crab pot frame
Tr 19-24	317599.31	4252487.94	317599.31	4252487.94	6.28	0.092	0.305	0.45	0	MEC	12 lbs	75 mm with fuze - Not Recovered
Tr20-7	319594.38	4253052.58	319594.38	4253052.58	8.78	0.133	na	0.08	na	na	na	too deep for diver to reach
Tr 29-13	319713.63	4251896.27	319713.63	4251896.28	8.29	0.159	na	0.56	na	na	na	good hit/too deep to reach
Tr 29-16	319978.44	4251993.56	319978.44	4251993.56	8.24	0.132	na	0.49	na	na	na	too deep to reach
Tr 14-10	320019.15	4253993.63	320019.15	4253993.63	2.93	0.136	0.457	0.16		Non-MEC	na	pipe runs too deep to remove
Tr 15B-1	313704.16	4251534.58	313704.16	4251534.59	2.81	0.247	na	0.17	na	na	na	diver could touch it but not ID it
Tr 15B-2	313735.03	4251580.01	313735.03	4251580.01	2.43	0.129	0.305	0.10	0	Non-MEC	2 lbs	pier piling w/ bolt and nut
Tr 16B-1	314051.12	4251635.50	314051.12	4251635.50	5.89	0.119	0.330	0.67	0	Non-MEC	20 lbs	metal ring
Tr 16B-2	314100.23	4251654.08	314100.23	4251654.08	6.10	0.138	0.610	0.63	0	Non-MEC	10 lbs	home made anchor
Tr 15-1	317910.12	4253117.64	317910.12	4253117.64	1.90	0.077	0.203	0.34	2	Non-MEC		bait cage of crab pot
Tr 13-1	317773.06	4253346.60	317910.12	4253119.77	2.4	0.123	0.203	0.46	0	Non-MEC	2 oz	ball of wire on surface
Tr 15-2	318318.07	4253268.43	317773.06	4253346.60	2.60	0.128	na	0.42	na	na		too deep for diver to reach
Tr 29-8	316194.31	4250679.51	316194.31	4250679.51	5.84	2.661		-1.82				
Tr 22-6	314210.17	4250901.59	314210.17	4250901.59	7.45	0.14	0.508	0.44	8	Non-MEC	1 lb	chicken wire
Tr 16B-3	314293.64	4251727.45	314293.64	4251727.45	6.67	0.074	na	0.66	na	na	na	too deep for diver to reach
Tr 16B-4	314344.86	4251744.32	314344.86	4251744.32	6.81	0.105	na	0.60	na	na	na	too deep for diver to reach
Tr 18-8	314850.08	4251651.60	314850.08	4251651.60	7.68	0.157	0.610	-0.20	0	Non-MEC	10 lbs	crab pot

Table 5-6. Continued

	Predicted Location		Reacquired Location		Water Depth	Size		Burial Depth		Class	Weight	Diver Description
ID	UTM X	UTM Y	UTM X	UTM Y	(m)	Predicted (m)	Actual (m)	Predicted (m)	Actual (in)			
Skiff 3-6	317790.01	4253347.19	317567.52	4253366.41	1.78	0.094	na	0.10	na	na		too deep for diver to get to
Skiff 3-8	317567.50	4253366.40	317711.32	4253621.50	0.7	0.068	0.381	0.13	6	MEC Scrap		OE Frag
Skiff 3-10	317623.47	4253422.22	317623.47	4253422.22	0.87	0.058	0.000	0.29	0			large contact to deep to dig
Skiff 3-14	317693.13	4253442.63	317693.13	4253443.24	1.1	0.069	0.229	0.24	8	Non-MEC		nonmec frag machine part
Skiff 3-20	317709.39	4253619.18	317709.39	4253619.79	0.63	0.098	0.305	10in	12	Non-MEC	80 lb	80 lb non mec scrap
Skiff 3-21	317711.13	4253621.26	317711.32	4253621.50	0.63	0.049	0.152	0.22	12	Non-MEC		non mec scrap
Skiff 3-22	317797.35	4253709.03	317797.34	4253709.13	0.73	0.086	0.356	0.45	6	MEC		81 mm morter
Skiff 3-23	317812.63	4253725.43	317812.63	4253725.73	0.73	0.076	0.305	0.32	12	Non-MEC		non oe scrap
Skiff 3-25	317827.69	4253747.23	317827.76	4253747.22	0.73	0.100	0.305	0.43	10	MEC Scrap		frag 4.2in morter
Skiff 3-26	317830.61	4253751.09	317830.54	4253751.05	0.74	0.108	0.610	0.32	4	MEC Scrap		OE Scrap
Skiff 3-28	317863.71	4253767.45	317863.71	4253767.75	0.78	0.125	0.229	0.31	6	MEC		4.2in Mortar
Skiff 3-29	317882.10	4253777.52	317882.00	4253777.51	0.79	0.070	0.305	0.30	5	MEC Scrap		MEC Frag
Skiff 3-30	317889.24	4253780.03	317889.24	4253780.33	0.85	0.093	0.305	0.31	9	MEC Scrap		OE Frag
Skiff 3-32	317929.91	4253792.50	317929.95	4253792.54	0.9	0.109	0.152	0.47	10	MEC Scrap		1 base 4.2in morter ,1 fuze under base
Skiff 3-33	317947.56	4253800.75	317947.55	4253800.82	0.93	0.104	0.457	0.33	18	MEC		4 deuce 18 in deep
Skiff 3-34	317963.47	4253804.74	317963.47	4253804.75	1.01	0.105	0.305	0.27	4	MEC Scrap		OE Frag
Skiff 3-35	317867.66	4253811.28	317867.66	4253811.28	0.69	0.146	0.305		6	MEC Scrap		OE Frag
Skiff 3-36	317978.22	4253945.82	317978.22	4253945.82	0.64	0.080	0.254	0.36	10	MEC		cylindrical piece of metal
Skiff 3-37	318027.81	4253957.43	318027.81	4253957.43	0.77	0.099	0.203	0.54	8	MEC		2.75 warhead
Skiff 3-38	318112.76	4254064.52	318112.76	4254064.52	0.71	0.085	0.610	0.45	18	NON-MEC		non mec band
Skiff 3-12	317673.00	4253437.10	317673.07	4253437.26	1.01	0.081	0.102	0.62	1	MEC Scrap	4 oz	2.75 rocket fin
Skiff 3-19	317703.90	4253605.45	317703.77	4253605.52	0.66	0.070	0.610	0.44	7	MEC	4 lbs	2.75 rocket motor
Skiff 3-27	317849.95	4253764.34	317849.96	4253764.35	0.75	0.155	0.102	0.50	2	MEC Scrap	2 lbs	61 mm mortar tail end
Skiff 3-31	317923.03	4253790.16	317923.03	4253790.18	0.89	0.152	0.102	0.45	9	MEC Scrap	1 lb	frag
Skiff 3-15	317680.36	4253571.92	317680.41	4253571.93	0.68	0.216	2.134	0.78	10 in	Non-MEC		7ft long piece of 5 in. pipe - Not Recovered
Skiff 3-3	317646.94	4253294.49	317646.93	4253294.49	1.69	0.235	0.457	0.93	12	MEC	9 lbs	81 mm mortar
Skiff 3-4	317736.20	4253330.29	317736.15	4253330.30	1.78	0.237	0.457	0.80	15	MEC Scrap	15 lbs	frag
Skiff 3-18	317902.31	4253649.54	317902.53	4253649.59	1.94	0.176	0.152	0.63	5 in	MEC Scrap	1 lb	2.75 frag
Blanket -3	319654.29	4254089.30	319654.29	4254089.30		0.086	na	0.3	na	na	na	small contact could not reach
Blanket -8	319676.83	4254143.69	319676.83	4254143.69		0.124	0.152	0.4	5	MEC Scrap	1 lb	1 lb frag
Blanket -15	319785.24	4254197.62	319785.24	4254197.62		0.093	0.610	0.1	6	MEC		4.2 mortar w/fuze left in place
Blanket -19	319880.81	4254181.54	319880.81	4254181.54		0.104	0.076	0.1	2	MEC Scrap		frag
Blanket -28	319839.95	4254208.24	319839.95	4254208.24		0.109	0.305	0.2	6	MEC Scrap	15 lb	15 lb chunk of frag
Blanket -30	319788.08	4254238.74	319788.08	4254238.74		0.129	0.914	-0.2	0	MEC		2.75mm rocket w/partial warhead
Blanket -39	319690.13	4254262.76	319690.13	4254262.76		0.108	0.025	0.2	2	Non-MEC		Broken scrap metal
Blanket -43	319936.29	4254280.68	319936.29	4254280.68		0.135	0.254	0.2	8	MEC Scrap		ore diver could retrieve
Blanket -57	320489.58	4254385.90	320489.58	4254385.91		0.103	0.102	0.3	4	MEC Scrap	1 lb	1 lb chunk of frag
Blanket -66	320161.94	4254395.17	320161.94	4254395.17		0.099	0.127	0.2	2	MEC Scrap	1 lb	1 lb chunk of frag
Blanket -69	320618.57	4254430.54	320618.57	4254430.54		0.1	0.152	0.2	6	Non-MEC		soda can
Blanket -70	320657.36	4254464.60	320657.36	4254464.60		0.1	0.203	0.4	15	MEC Scrap		frag
Blanket -71	320558.68	4254474.96	320558.68	4254474.96		0.1	0.127	0.2	10	MEC Scrap		frag
Blanket -73	320629.39	4254478.13	320629.39	4254478.13		0.1	0.305	0.3	0	MEC Scrap		2.75mm rocket tail fin
Blanket -75	320677.74	4254537.77	320677.74	4254537.77		0.1	0.051	0.1	10	MEC Scrap		frag
Blanket -76	320586.72	4254552.56	320586.72	4254552.56		0.1	0.152	0.3	8	MEC Scrap		frag
Blanket -77	320655.61	4254546.45	320655.61	4254546.45		0.1	0.203	0.3	10	MEC		part of 81mm mortar
Blanket -78	320524.88	4254524.01	320615.54	4254590.29		0.1	0.038	0.4	7	MEC Scrap		frag
Blanket -81	320615.54	4254590.29	320524.71	4254524.18		0.1	na	0.4		Non-MEC		crab pot too deep to retrieve
Blanket -83	320782.59	4254635.30	320782.59	4254635.30		0.1	na	0.2		Non-MEC		crab pot too deep to retrieve
Blanket -4	319807.78	4254156.28	319807.81	4254156.34	3.32	0.107	0.610	0.20	12	MEC	6lbs	5 in rocket motor
Blanket -12	319693.31	4254192.99	319693.35	4254193.26	3.35	0.110	0.762	-0.05	0	Non-MEC	4 lbs	sheet metal
Blanket -31	319762.05	4254222.87	319762.05	4254222.99	3.35	0.126	0.914	-0.20	4	MEC	4 lbs	2.75 rocket motor
Blanket -42	319728.69	4254264.70	319728.68	4254264.69	3.25	0.129	0.127	0.09	7	MEC Scrap	1 lb	2.75 venturi
Blanket -49	319978.63	4254303.44	319978.72	4254303.48	2.73	0.129	0.102	-0.21	6	MEC Scrap	1 lb	frag
Blanket -82	320933.14	4254614.10	320933.19	4254614.16	2.77	0.113	0.203	0.34	6	MEC Scrap	1 lb	2.75 frag

6.0 DATA ANALYSIS AND PRODUCTS

6.1 Data Preprocessing

Raw survey data were processed using standard Geosoft montaj® utilities and results were available for inspection each morning following the prior day's survey. The techniques that are used to preprocess the raw data are equivalent to those that we have used for over a decade to prepare data from other MTA marine surveys, from MTADS helicopter magnetometer array surveys, and from MTADS towed vehicular surveys. Data from outside the designated survey area are deleted, as are data from turn-arounds and from periods when the platform is not moving. The individual sensor baseline levels are correlated and a down-the-track smoothing filter is applied to the data. The data are leveled to a common background null reading (each time datasets are combined) and finally, the data are interpolated onto a (previously established) grid for loading into the target (anomaly) analysis software. Several other quality control checks are also applied each time a dataset is preprocessed. These include confirming that the appropriate layback values (associated with each cable deployment) are being used, that the angular encoder, platform yaw, and platform altitude values are correct and consistent. These are evaluated basically using data image inspections.

"Course-Over-Ground" plots and dipole image presentations of the data were prepared, which allowed additional quality control evaluations to be made. Additional Track Files were prepared (as required) for insertion into the Pilot/Survey Guidance display to allow resurvey of areas that were missed or areas where survey data quality were not acceptable.

Each day the master survey data file was updated to include all accepted survey data. The files are formatted for input to the MTADS DAS, at which time individual target analyses can be undertaken. In this operation, separate master survey files were maintained for the Calibration Lane surveys and the skiff surveys. All remaining magnetometry data were incorporated into a single master MTADS DAS data file.

6.2 Target Selection and Target Analysis

The MTADS DAS (version adapted for MTA analyses) was used for all target analyses. The MTADS DAS target fitting routine carries out an iterative fit of the sensor information in a data clip (defined by the analyst to encompass the visible anomaly) to a dipole signature. The input data to the fitting routine are based upon three dimensional coordinates (the UTM coordinates and HAE of each sensor reading) and the value of the sensor reading. This allows overlapping data from multiple passes of the sensor platform (at differing heights above the bottom) to be appropriately incorporated into the individual anomaly fit. The fitting routine is also fully three dimensional and the output of the fitting process reports the coordinate position of the center of the object (UTM coordinates and HAE), the apparent induced magnetic moment and the inclination and azimuth of the induced dipole, the fit quality of the dipole approximation, and a derived predicted caliber of the target (assuming a cylindrical shape with a length to diameter ratio of 4). Additionally, the maximum and minimum signal strength and the water depth at the target position are recorded.

Figure 6-1 shows a screen clip from the MTADS DAS analysis of an individual target in this survey. The discussion below describes the analysis workflow and some of the analysis images, tools, and routines available to the analyst during the fitting process. The Site View window (partially shown on the upper left) shows the entire survey area with the 30 X 30 m analysis area outlined in white. The analysis window (partially shown in the center) is used by the analyst to select individual targets for analysis. In this case the analyst boxed an area by using the computer mouse to draw a polygon surrounding the anomaly. The position and display scale of any of the images shown in the figure can be changed by the analyst. The data bounded by the polygon are submitted to the analysis algorithm to carry out the iterative fit described in the previous paragraph. The fit window (half of which is shown on the right of Figure 6-1) shows plots of the data submitted for analysis and the best dipole fit to that data (The fit image lies to the right of the image that is shown in Figure 6-1).

The image in the Fit Window shows that this anomaly has data contributed from parts of four passes by the sensor platform. If the analyst notes that there are contributions from an additional anomaly in the Fit Data, using the computer mouse, he can delete the parts of individual sensor tracks from the analysis, and then rerun the analysis. Alternatively, if the analyst notes that there are widespread geologic features that contribute a varying interference offset to all the data displayed in the Fit Window, he can invoke a leveling tool that will level all the data in the display to the best flat background level. The fit can then be rerun. Following the iterative fit, which usually takes about one second, the Fit Values are displayed on the left side of

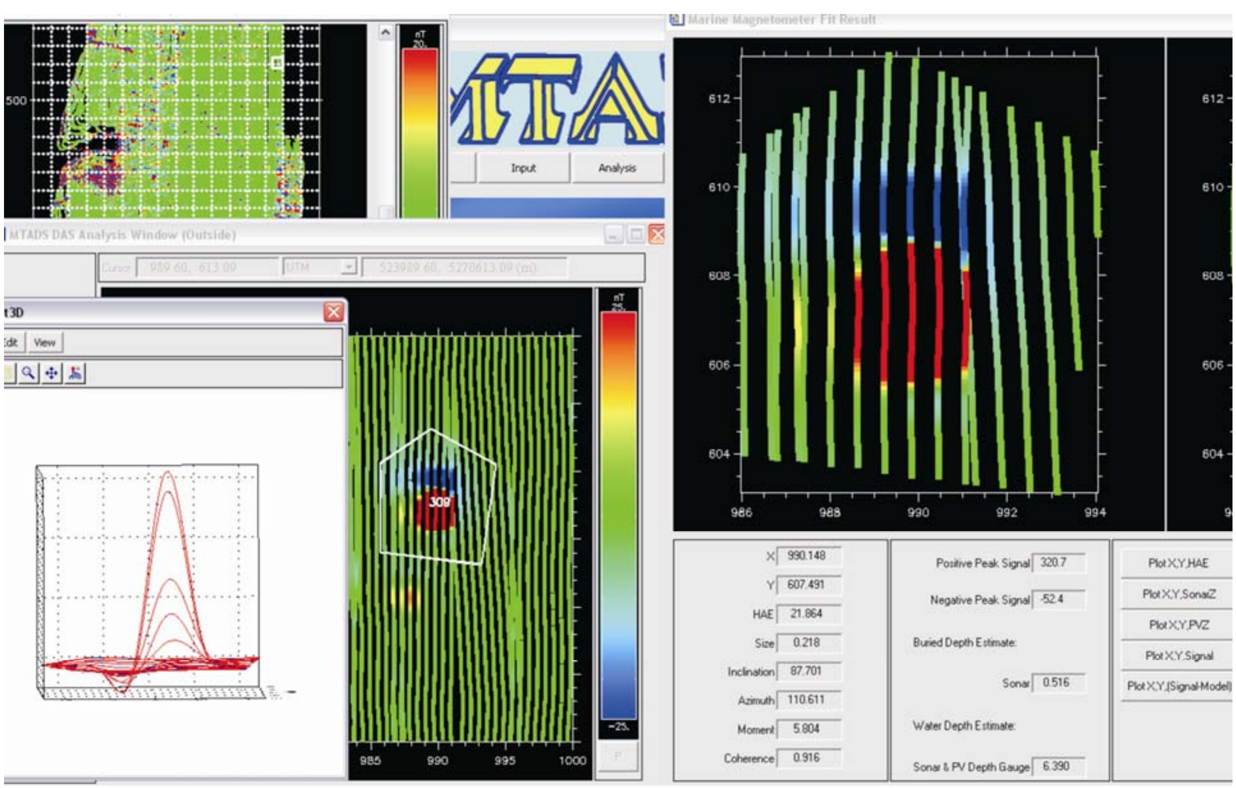

Figure 6-1. A screen clip from the MTADS DAS analysis of Target 309 is shown. See the text for a discussion of the individual components of the image.

the Fit Window. In the center panel of the displayed area of the fit window information is provided about the signal parameters, the (raw) estimated depth, and the water depth. The estimated burial depth must be later corrected for the (variable) depth of the sonar sensor below the water surface. In this case, it was 0.5 m, so the predicted burial depth is only about 1.6 cm.

On the lower right of the Fit Window display are radio buttons for several analysis options available to the analyst. These are described below. The analyst has several additional tools to help him make decisions about an individual target and the fitting process that has taken place. These tools include: (1) a 3-dimensional presentation of the altitude above the bottom for each sensor track for the various platform passes that contributed to the analysis data; (2) a 3-dimensional presentation of the individual sensor readings along the tracks created by the platform passes contributing to the analysis data; and (3) a 3-dimensional plot of the residuals resulting from subtracting the dipole fit from the data entered into the analysis.

The altitude plot can be used to quickly determine the altitude above the bottom of the sensor platform in the passes that contributed to the data clip and to show whether the platform was in a roll attitude during one of the passes. The plot of the sensor data can reveal many things such as whether there were multiple objects contributing to the signal, whether there was clutter around (or on top of) the primary object that confused the dipole fit, or whether there were significant remnant moment contributions to the signature.

The image on the lower left of Figure 6-1 shows an example of the use of the (Plot XY Signal) analysis tool. In this plot of the site window, the analyst has rotated the image so that we are looking cross track from west to east. The data are very clean, showing only a single major anomaly with no significant clutter and a flat background. Once he is satisfied with the overall fit process, the analyst then has the option to type a narrative comment and accept the fit and enter it as part of the target analysis record.

Following the initial fitting process, additional recorded sensor data from the vessel and the sensor platform are used to reduce the HAE value of the target fit to a burial depth of the object below the sediment surface.

6.3 Target Classification and Training

Before each target fit is logged, the analyst has the opportunity to record narrative observations relating to the target and a **subjective** numerical target classification approximation. In this demonstration, targets were classified on a four point scale:

- 1 denotes a target with the highest probability of being ordnance,
- 2 denotes a target that deviates from an excellent dipole fit, but still has a good probability of being ordnance (perhaps it is located in a mildly cluttered environment),
- 3 denotes an anomaly signature that strongly deviates from a simple ordnance dipole; it is unlikely to be ordnance, but not conclusively so (it may lie in a highly cluttered field, or be mixed up with an overlapping signature from other nearby objects, and
- 4 is an analyst’s declaration that the anomaly is conclusively not an ordnance item.

Classification of anomalies by probability of their being ordnance and by likely identity (size) was not done by any type of software-developed filter for data analysis in this demonstration. As extensively described above, a single human analyst working with the MTADS DAS software utility analyzed all data and classified all targets using the parameters generated from the MTADS DAS anomaly fits, the additional available MTADS DAS analysis tools described above, and subjective decisions based on decades of experience made and recorded the target classification decisions. The 1-4 scale (described above) was used for classifying the probability of analyzed targets being UXO.

The human-in-the-loop analyst also has the ability to shade his target classifications based upon the fitting results for the targets in the classification lane, his knowledge of the types and sizes of ordnance previously dropped and/or fired onto the site and the previous usage and history of the site (e.g. were there identified target impact locations, what were the previously existing site usage histories or post usage practices). Does one expect to see evidence of farm implements, cattle grazing (fences), troop training exercises, pipelines, utilities, etc?

A site that has a history of usage of fired projectiles or dropped GP bombs will likely have dud ordnance in almost pristine undistorted condition (and perhaps a large amount of small background clutter from shrapnel from detonations). These types of dud ordnance are seldom seriously distorted by impact.

Alternatively, a site that has been heavily used for mortar training or training using (relatively) inert ordnance such as BDU-33s or M38s will likely be cluttered by highly distorted or partially fragmented ordnance shapes. While such ordnance is typically considered as inert, it still is potentially hazardous because of potentially unactuated spotter charges.

Finally, an extremely important training aid for the analyst can result if the analysis process is still ongoing while target recovery takes place. Feedback information, resulting from recovered targets can be used by the analyst to significantly improve his classification calls during the analysis process if he uses this information to guide his future analyses and classification calls.

6.4 Survey Work Products

The primary work products of the MTA geophysical ordnance surveys are the target reports that result from the analysis of the anomaly data in the mapped data files. These target reports contain all the descriptive information described above relating to each of the anomaly fits carried out by the analyst. These files, in the form of Excel spreadsheets are included as appendices to this report for all the MTA transect and blanket surveys and for the skiff survey data.

Additional, survey work products in the form of graphical images representing the mapped survey data, are included as examples within the report.

Finally, as a work product of these surveys, when targets are recovered following the survey, each recovered object is (brushed or wiped) clean and digitally photographed in a setting that identifies the target by its record identification number and narrative description in the photograph.

The mapped data files that result from the preprocessing of our survey data are submitted and stored electronically by the ESTCP Program Office for all surveys. These data are suitable for imaging or reanalysis by others. They can be accessed by contacting the ESTCP Program Office.

7.0 PERFORMANCE ASSESSMENT

The quantitative and qualitative performance objectives are enumerated in Tables 3-1 and 3-2. In Table 3-1 a specific descriptive response is entered describing the performance relating to the individual numerically-quantifiable objective statements. These are individually addressed below.

Magnetometry Survey Production Rates: Conducting transect surveys in water depths of less than 25 ft, the normal survey speed is ~2m/sec. This correlates with a survey coverage rate of 3.6 ha/hour (or 8.9 acres/hour). Surveying with the platform at 30 ft deep requires reducing the survey speed to about 1.8 m/sec. In blanket surveys, our track spacing is nominally 4 meters, thus reducing the coverage rate by about 20% over transect surveys. These production rates are documented in our daily SAIC Sailing Logs, in our daily survey logs, and in our survey data files (Table 5-3).

EM Survey Production Rates: It was decided during the development of the demonstration plan for this survey that no EM survey work would be conducted.

Calibration Targets: The calibration targets are described in Section 5.1. Their installation is shown in Figures 5-5 and 5-6. The magnetic anomaly image map of the MTA survey of the Calibration Line is shown in Figure 5-7. The performance of the MTA system with the Calibration Lane targets is presented in Table 5-1. Because the calibration targets were degaussed before they were installed their fit locations, size estimates and depth predictions were excellent.

Target Location Accuracies: The best measurement of the target location accuracies is based upon the MTA performance surveying the Calibration Lane. The data in **Table 5-1** indicate that the MTA target location accuracies approach ±25 cm. The reports of the diver investigations provide much less insight on the location accuracies, because they are convoluted with the target reacquisition and marking process and the diver investigation and reporting accuracy based upon the after-dive notes. The fact that the large majority of targets were successfully prosecuted however indicates that the overall location, reacquisition, marking, and recovery operations are nominally accurate to the ~1 meter level.

Survey Coverage/Missed Survey Areas: Overall survey coverage and missed survey areas are not nominally an issue in transect surveys because they are exploratory in nature and it matters little if a transect deviates by a few meters from its nominal grid position. In our blanket survey area, missed areas were primarily generated by the requirement to drive around the buoys and lines attached to crab pots. There was no opportunity to fill in these areas, because the crab pots were controlled by fishermen. Additionally, the blanket survey was not intended to support a complete cleanup of the blanket survey area. Targets were selectively analyzed to provide a prioritized target list to support limited target investigations.

Depth Station Keeping: Nominally, all MTA surveys are conducted with the sensor platform operating in the altitude (above the bottom) mode under control of the autopilot. When the bottom is flat, and the water depth and vessel speed are within nominal parameters, the platform

altitude is controlled within about ~0.1 m continuously. When the bottom level abruptly changes the autopilot instantly begins driving the platform altitude up or down to maintain the specified altitude above the bottom. It typically takes the sensor platform 10-20 seconds to respond to and restabilize when the bottom level changes by a meter. The platform altitude is one of the data strings that is continuously recorded because it is required in the three dimensional data processing and target fitting routines.

Difficulties in station keeping occur when the platform is being operated very deep at vessel speeds that exceed the system capabilities. Operating the sensor platform at a depth of 9 meters typically requires the vessel speed to be reduced to ~1.6 m/sec to maintain the specified altitude.

Another station keeping difficulty arises when the large abrupt bottom changes occur unexpectedly. Such a situation can cause the platform to impact the bottom if the rate of change exceeds the platforms response rate. In these situations, we typically have a visual warning provided by our new Lowrance bottom profiling instrument. In these situations, the boat driver has two options; either he must abruptly turn away from the obstruction or pull the vessel into neutral, which abruptly slows the vessel speed and allows the platform to vertically rise because of its natural buoyancy.

Typically, NOAA Marine Charts accurately warn of changing bottom conditions and allow the MTA survey to be programmed to take them into account. In the Potomac River, this was not always the case. Dredge spoils along the eastern edge of the navigation channel presented unexpected hazards until we had them generally mapped out during the progress of the survey.

Our survey performance with respect to the qualitative performance objectives are presented in Table 3-2 and are generally self explanatory. Our time lost because of equipment failures was minimal (see Table 5-2); necessary repairs were made from spares inventory. The logistics to support overnight mooring were good and required only a few minutes of ferry time between the marina and the survey grids. Some time was lost because of weather (high winds and high sea states) but these were within expected norms for the location and the time of the year.

The Blossom Point demonstration was the first time that we have supported skiff surveys using equipment entirely owned by SAIC. We took delivery of the skiff survey vessel during the demonstration. Two crew members worked for part of two days to build-out and outfit the skiff to support the shallow water surveys that were specified.

Overall, we completed all work specified in the Work Plan and directed by the Program Office during the course of the operation. We finished more quickly than specified in the Work Plan and provided all work products to effectively support the diver target investigations.

7.1 Diver Intrusive Investigations

One of the objectives of this demonstration involved creation of the survey work products to support diver intrusive investigations of a sampling of targets representative of the site. We have described the data analysis process and the creation of the Target Lists from the analysis and creation of the recommended "Dig Lists" for investigation in Chapter 6. Our suggested dig lists were reworked by the Program Office to more uniformly distribute the targets for investigation across the entire survey area and across the MTA transect and blanket survey areas and the Skiff Adjunct survey transects.

Diver investigations were carried out by EOTI under a contract (separate from the SAIC demonstration) managed by the Navy. SAIC provided some initial training for the EOTI divers (and SAIC-owned GPS equipment) to support the initial diver target reacquisition and intrusive investigations.

8.0 COST ASSESSMENT

8.1 Cost Model

The cost model for this report is based upon the expenses incurred while conducting the MTA survey at the Blossom Point site of the ARL facility in the Potomac River. The operating conditions and the scope of the demonstration are those of the actual survey operation described in this report.

The operation of the MTA requires three persons in the field operating the MTA vessel, and a fourth person in the field operating the chase boat, which provides support to the MTA vessel. In addition, a fifth person supports the demonstration on site by processing all the survey data on an overnight turn around schedule. The onsite processing provides a quality control function assuring that all data are comprehensive and complete. The onsite data processor is also necessary if near concurrent target investigations take place during or immediately following the survey. Concurrent target investigations require that target analyses also be concurrently carried out, along with preparation of target lists and recommended prioritized dig lists.

The actual onsite Blossom Point survey was carried out by SAIC personnel working extended work day seven day work weeks for a two week survey. The cost model information presented below in Table 8-1 is based upon a more realistic normal work day (and five day work week) for a three week survey period.

At the time this report was written, the MTA (hardware, software, and electronic) equipment is 5 years old. This system was a one-off pre-prototype design, which required several hundred thousand dollars of engineering and modeling design work prior to construction. To approximate its component and integration costs on this basis would not be realistic. Additionally, based upon 6 extended field survey operations, a fully field worthy (commercializable) prototype would have a somewhat different design than the original. The costs to develop and build a new instrument would depend upon its application requirements (survey depths, daily production rates, range of weather and water conditions for operation, etc).

Based upon current component costs we estimate that fielding a system with a similar design to the MTA (capable of surveying 30-50 acres/day in water up to 50 ft deep, in sea state 2 conditions) would cost $450-$750K. The major uncertainties evolve around whether it would be used in the open ocean and whether it would be based upon an owned (dedicated) vessel or would use a vessel of opportunity requiring significant modifications for each field operation.

8.2 Cost Drivers

The primary cost drivers for extended area MTA surveys are labor costs and the recovery costs for the capital equipment. Each of these is driven by the complexity of the R&D system.

A newly-produced commercial system would be expected to be less complex to implement and operate, thus taking pressure off both of these cost drivers.

Table 8-1. Cost Estimate for a 3 Week MTA Survey at the Blossom Point Research Facility

Cost Estimates for 3 Week MTA Survey at Blossom Point

Cost Element	Expense	Mileage	Labor	Lodging/ Per Diem	Gas	ODCs	Total
Instrument Cost							
PreMobilization							
Evaluation Trip (Logistics)		$140.00	$3,200.00	$218.00			
MTA Repair	$10,000.00						
Demonstration Plan	$10,000.00						
HASP	$5,000.00						
Mobilization							
Cary/Blossom Point		$150.00					
Equipment Load-out/Cary	$250.00		$1,757.60				
Transport Cary-Blossom Point							
SUV/2 days	$350.00				$60.00		
Box Truck/2 days	$143.00	$120.00			$50.00		
Chase Boat/2 days	$800.00						
Skiff/2 days	$600.00						
Airfare Champaign/RDU (RT)	$800.00						
All hands one day (4 men-8 hr) Cary-to-Blossom Point			$4,257.44	$872.00			
All hands 2 days (4 men-8 hr) Unpack, Assemble, Launch			$8,514.88	$1,744.00			
Subtotal	$27,943.00	$410.00	$9,215.04	$2,834.00	$110.00		
TOTAL PRE-MOB/MOB COSTS							**$40,512.04**
Survey Operations							
SAIC Costs							
Week 1			$18,911.81	$6,104.00		$500.00	
Week 2			$18,911.81	$6,104.00		$400.00	
Week 3			$18,911.81	$6,104.00		$300.00	
Box Truck	$3,003.00				$150.00		
SUV	$4,189.50				$200.00		
Boats/Crews							
Tow Vessel/generators					$675.00		
Chase Boat	$8,400.00				$150.00		
Shallow Water Survey Boat	$3,000.00				$250.00		
Chase Boat Support	$6,300.00		$24,022.38				
Equipment Maintenance	$5,000.00						
Consumables/Supplies	$2,500.00						
Subtotal	$32,392.50	$0.00	$80,757.80	$18,312.00	$1,425.00	$1,200.00	
TOTAL Blossom Point SURVEY OPERATIONS							**$134,087.30**
Demobilization							
Disassembly 3 men, 1 day			$16,855.89	$654.00			
Packout 3 men, 1 day			$16,855.89	$654.00			
Equip Transport Blossom Point/Cary	$0.00		$16,855.89				
Rent Car (2 days)	$199.50				$50.00		
Box Truck (3 days)	$71.50				$120.00		
Subtotal	$271.00	$0.00	$50,567.67	$1,308.00	$170.00		
TOTAL DEMOB COSTS							**$52,316.67**

8.3 Cost Benefit:

There are currently no underwater survey instruments commercially available to provide geophysical digital mapping analyses for UXO explorations. The current technology, to the extent that it exists, employs divers with hand-held metal detection sensors and/or cameras swimming grid patterns. Typically, if a MEC object (or a suspected MEC object) is discovered the target would be marked with a weight and buoy for later further investigation or recovery.

This approach is slow, expensive, inefficient, and does not produce an electronic record of the geophysical exploration.

The MTA has been extensively demonstrated in a variety of applications ranging from wide area transect survey explorations to 100% bottom mapping to support MEC clearance operations. The production rates, production costs, and system limitations have been extensively explored and documented following the six field demonstrations.

9.0 IMPLEMENTATION ISSUES

9.1 Regulatory Issues

The regulatory issues associated with this demonstration are described in the Site Inspection Report.[5] The operations associated with the MTA demonstration survey are non-intrusive and do not require permits or an Explosives Safety Submission and are not subject to environmental regulations. The survey was carried out in public waters controlled by the State of Maryland. "The Maryland Department of Environment [MDE] was extensively involved with all aspects of the MMRP SI at Blossom Point and expressed a keen interest in the ultimate fate of the munitions on the shoreline and in the water at Blossom Point. MDE has expressed an interest in remaining engaged in how the Army plans to address water sites throughout the U.S. and particularly within the State of Maryland."[11]

9.2 End User Issues

The most likely end users of this technology are the commercial UXO service provider firms, in association with ACE/Huntsville, the Regional Offices of the Corps, the Regional Offices of the Naval Facilities Engineering Command, and individual DoD installation commanders. Other likely users include the NAVFAC and Navy/Marine Corps installation managers who are responsible for training ranges with marine MEC contamination problems. The results of this demonstration were monitored by members of the Army Corps, NAVFAC, and the Navy NOSSA Office, and ERDC.

The instrumentation being used in this demonstration is a custom-built prototype. However, with a few exceptions it has been constructed with COTS components. The unique components in the MTA are the fiberglass sensor platform, the tow cable and underwater electronics housing, the EM68 sensor, and some custom-designed PCBs. Each of these components are fully described elsewhere, and could be purchased from the original manufacturers. There are no proprietary technologies embedded in the Marine Towed Array.

9.3 Availability of the Technology

The MTA has been deployed to six extensive marine demonstrations. It has performed under a wide range of conditions and at highly diverse sites. The system was originally designed and built to support two demonstrations. It has far exceeded this expectation; however this has been at the cost of extensive required repairs between operations, which have ranged from $5-10K following each deployment. Some of the hardware components have reached their lifetime limits and many of the electronic and computer components no longer represent the SOA in technology. The current MTA platform is capable of continued use; however a more field worthy commercial instrument should be built. This will likely not take place until there is sufficient recognizable work scheduled to justify the substantial capital investment that will be required.

9.4 Specialized Skills

The MTA is a very complex instrument, similar in many ways to the technological requirements that it takes to field sensor arrays on land (or in airborne platforms) to support UXO surveys requiring digital electronic mapping work products. The MTA system is less complex and similarly difficult to operate than many of the marine geophysics platforms currently used in the oil exploration, pipeline, cable, and bathymetric mapping industries. These are healthy industries, supported by skilled technical staffs and high technology instrumentation.

10.0 REFERENCES

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3. ESTCP Project 200324, http://www.estcp.org/projects/uxo/UX-0324o.cfm

4. "Marine Towed Array Technology Demonstration at the Former Naval Duck Target Facility," Final Report 21 November 2005

5. "Site Inspection Report – Adelphi Laboratory Center – Blossom Point Research Facility, MD," Prepared for The United States Army Corps of Engineers, Baltimore District, Malcolm Pirnie, Inc. March 2007

6. EE/CA Study will begin in the Fall of 2007. It will address surface MEC, MPPEH and Munitions Debris along Nanjemoy Creek MRS and Potomac River South MRS

7. "Demonstration of the MTA on Ostrich Bay at the site of the Former Naval Ammunition Depot – Puget Sound, August 2006," Final Report, in preparation

8. "The MTA UXO Survey and Target Recovery on Lake Erie at the Former Erie Army Depot, ESTCP Project MM2003-24" Final Report, 25 January 2007

9. "Marine Towed Array Technology Demonstration Plan for Vieques Island, PR," 30 May 2007

10. "Marine Towed Array (MTA) UXO Geophysical Survey o the Island of Culebra, PR, July 2007," Final Report, Draft 30 August 2007

11. "Unexploded Ordnance (UXO) Innovative Technology Transfer Program," U.S. Army Military Munitions Response Program (MMRP), Blossom Point Research Facility, Maryland, 18 January 2007

12. Goose Bay Marina and Campground, Welcome, MD, www.goosebaymarina.com

APPENDIX A - POINTS OF CONTACT

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Best Western Inn 6900 Crain Hwy La Plata, MD			Tel: 301-934-4900

APPENDIX B – TARGET ANALYSIS LISTS

MTA Transect Surveys

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 1

Tue Oct 23 17:58:49 2007
SITE: Transect_1
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83
THIRD COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						Analyst Comments
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual	Comments
Tr1-1	-4713.76	-336.34	319286.24	4254663.66	-44.90	3.1	16	-4	0.113	0.19	0.78	43	301	0.91	ap1, 1
Tr1-2	-3930.21	-60.82	320069.79	4254939.18	-44.84	3.1	409	-86	0.203	0.14	4.53	90	341	0.62	ap2, part signature, 2
Tr1-3	-3541.12	75.41	320458.88	4255075.41	-45.00	2.9	15	-15	0.102	0.43	0.58	8	260	0.89	ap3, small target inverted, 2
Tr1-4	-2474.71	444.47	321525.29	4255444.47	-44.72	2.8	419	-58	0.260	0.35	9.53	62	229	0.98	ap7, inverted, 1
Tr1-5	-2169.22	554.52	321830.78	4255554.52	-44.83	2.8	9	-4	0.083	0.38	0.32	23	317	0.87	not ap, small target, 1
Tr1-6	-1894.39	633.13	322105.61	4255633.13	-44.95	2.8	99	-7	0.166	0.53	2.49	89	103	0.97	ap9, crab trap?, 3
Tr1-7	-1497.68	808.72	322502.32	4255808.72	-45.25	3.1	81	-36	0.190	0.49	3.70	37	345	0.94	ap10, crab trap?, 3
Tr1-8	-598.20	1083.72	323401.80	4256083.72	-45.46	3.4	166	-24	0.187	0.35	3.53	73	20	0.98	ap11, crab trap?, 3

MTADS TARGET REPORT BLOSSOM POINT MTA, TRANSECT 3

Wed Oct 31 17:14:34 2007
SITE: Transect_3
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83
THIRD COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 3-1	-4743.67	-480.79	319256.33	4254519.22	-46.21	3.2	15	-5	0.129	1.16	1.17	77	54	0.83	ap 0, too deep for UXO, 3
Tr 3-2	-4611.13	-429.70	319388.87	4254570.30	-45.72	2.9	33	-37	0.183	1.14	3.33	4	6	0.97	ap 1,likely crab pot, 3
Tr 3-3	-4074.05	-239.44	319925.95	4254760.56	-45.60	3.0	38	-47	0.167	0.68	2.53	-5	70	0.95	ap1, dig this, 1
Tr 3-4	-3615.83	-80.71	320384.17	4254919.29	-45.18	3.0	30	-26	0.139	0.18	1.47	3	65	0.91	ap3, dig this, 1
Tr 3-5	-3546.71	-56.33	320453.29	4254943.67	-44.76	2.7	33	-35	0.137	0.06	1.40	-2	268	0.77	not ap, dig this, 1
Tr 3-6	-2679.72	241.74	321320.28	4255241.74	-44.68	2.8	283	-42	0.224	-0.02	6.06	31	127	0.36	ap 7, crab trap?, 3
Tr 3-7	-1574.69	632.05	322425.31	4255632.05	-44.91	3.1	532	-136	0.257	-0.17	9.22	46	19	0.96	ap 9, good crab trap for recovery, 3
Tr 3-8	-304.44	1079.71	323695.56	4256079.72	-45.87	3.4	193	-8	0.195	0.40	4.05	87	90	0.89	ap 14, crab trap for recovery, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 5

Tue Oct 23 18:00:34 2007
SITE: Transect_5
SENSOR: mmag
SURVEY: AllSensors
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83
THIRD COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						Analyst Comments
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 5-1	-5380.74	-833.47	318619.26	4254166.53	-44.73	2.8	19	-17	0.118	0.29	0.88	5	120	0.899	ap0, inverted, small target, 1
Tr 5-2	-4737.18	-606.44	319262.82	4254393.56	-45.16	3.0	17	-10	0.100	0.48	0.55	21	55	0.907	ap2, good small target, 1
Tr 5-3	-4682.99	-587.18	319317.01	4254412.82	-45.72	3.0	9	-7	0.110	1.05	0.73	9	42	0.915	ap3, good small target, too deep?, 1
Tr 5-4	-4352.21	-472.77	319647.79	4254527.23	-45.51	2.5	10	-8	0.098	1.38	0.51	13	270	0.544	ap4, inverted, small target, too deep?, 2
Tr 5-5	-4318.93	-460.86	319681.07	4254539.14	-45.91	3.1	278	-270	0.331	1.07	19.69	6	108	0.774	ap5, large for crab trap, 3
Tr 5-6	-3862.51	-302.87	320137.49	4254697.13	-45.24	3.1	24	-19	0.140	0.44	1.49	11	43	0.771	not ap, good target, 1
Tr 5-7	-3841.30	-299.87	320158.70	4254700.13	-45.04	3.1	22	-6	0.099	0.33	0.52	35	81	0.740	ap7, 2
Tr 5-8	-3747.71	-258.02	320252.29	4254741.98	-45.80	3.0	15	-15	0.155	1.04	2.04	0	128	0.785	ap8, trash, 4
Tr 5-9	-3712.99	-248.86	320287.01	4254751.14	-45.23	3.0	12	-10	0.105	0.52	0.63	10	109	0.793	ap9, small inverted target, 1
Tr 5-10	-3032.97	-25.11	320967.03	4254974.89	-44.47	2.6	37	-34	0.140	0.24	1.49	6	85	0.884	ap12, inverted signal, 1
Tr 5-11	-2771.39	79.91	321228.61	4255079.91	-44.94	2.8	28	-17	0.135	0.42	1.33	8	82	0.913	ap13, inverted, 1
Tr 5-12	-2037.47	341.15	321962.53	4255341.15	-45.10	2.8	124	-10	0.198	0.62	4.24	86	2	0.982	ap15, crab trap?, 3
Tr 5-13	-627.92	833.71	323372.08	4255833.71	-45.51	3.4	41	-42	0.148	0.43	1.77	10	10	0.948	ap16, good target, 1
Tr 5-14	-535.59	862.22	323464.41	4255862.22	-45.60	3.4	332	-25	0.233	0.51	6.89	83	176	0.982	ap17, crab trap?, 3
Tr 5-15	-338.66	937.31	323661.34	4255937.31	-45.74	3.4	543	-50	0.267	0.63	10.37	79	359	0.971	ap18, crab trap?, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 7
Sat Oct 27 10:18:34 2007
SITE: Transect_7
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83
THIRD COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 7-1	-5596.84	-1031.71	318403.16	4253968.29	-45.23	2.63	26	-8	0.146	0.72	1.68	48	6	0.726	not ap, good target, 1
Tr 7-2	-5569.71	-1025.67	318430.29	4253974.33	-44.49	2.74	17	-8	0.081	-0.12	0.29	89	90	0.685	not ap, good small target on surface, other targets too close for digging
Tr 7-3	-5554.32	-1020.03	318445.68	4253979.97	-44.52	2.83	54	-78	0.156	-0.13	2.06	6	349	0.777	ap 3, maybe not crab trap, on surface, 1
Tr 7-4	-5543.25	-1015.86	318456.75	4253984.14	-44.49	2.85	8	-14	0.082	-0.21	0.30	-25	226	0.807	ap4, highly inverted, 2
Tr 7-5	-5520.56	-1010.34	318479.44	4253989.66	-44.60	2.88	33	-17	0.125	-0.11	1.06	16	26	0.798	ap5, part signature, on surface, 1
Tr 7-6	-5507.59	-1005.59	318492.41	4253994.41	-45.28	2.90	45	-22	0.192	0.54	3.87	17	310	0.662	ap6, part signature, not crab pot, 1
Tr 7-7	-5448.09	-984.30	318551.91	4254015.70	-44.52	2.97	15	-9	0.083	-0.27	0.31	22	12	0.874	ap7, good small target, too much clutter around to dig, 2
Tr 7-8	-5391.53	-968.59	318608.47	4254031.41	-44.75	3.04	15	-7	0.090	-0.17	0.39	21	62	0.664	ap11, good small target on surface, 1
Tr 7-9	-5135.96	-877.71	318864.04	4254122.29	-45.93	2.78	13	-6	0.152	1.29	1.89	25	281	0.881	ap18, good target, too deep to dig., 2
Tr 7-10	-5092.95	-862.08	318907.05	4254137.92	-45.52	2.78	29	-8	0.137	0.9	1.41	80	133	0.626	ap20, might be anchor, too deep?, 2
Tr 7-11	-5044.38	-845.83	318955.62	4254154.17	-45.46	2.78	17	-6	0.120	0.83	0.95	36	110	0.787	ap21, good target, too deep to dig?, 2
Tr 7-12	-5021.46	-839.08	318978.54	4254160.92	-45.58	2.78	9	-8	0.100	0.95	0.53	81	90	0.682	ap22, very small target, too deep to dig, 2
Tr 7-13	-4671.22	-714.87	319328.78	4254285.13	-45.19	2.97	13	-5	0.088	0.4	0.37	54	138	0.737	ap24, very small target, 1
Tr 7-14	-4658.37	-708.76	319341.63	4254291.24	-45.00	2.98	67	-13	0.127	0.18	1.11	88	179	0.612	ap25, good target, 1
Tr 7-15	-4605.87	-690.96	319394.13	4254309.04	-47.56	3.05	18	-11	0.254	2.63	8.90	0	62	0.898	ap26, hot rock?, 4
Tr 7-16	-4225.34	-559.88	319774.66	4254440.12	-45.41	3.07	305	-27	0.234	0.45	6.96	65	321	0.977	ap28, crab pot, 3
Tr 7-17	-4215.92	-556.69	319784.08	4254443.31	-45.73	3.09	8	-10	0.082	0.75	0.29	85	155	0.529	ap 29, very small target, too deep?, 2
Tr 7-18	-4201.65	-551.78	319798.35	4254448.22	-45.33	3.10	13	-2	0.075	0.37	0.23	35	63	0.858	ap30, very small target, 1
Tr 7-19	-3977.15	-466.15	320022.85	4254533.85	-44.82	2.66	17	-5	0.095	0.39	0.46	29	294	0.807	ap33, very small target, 1
Tr 7-20	-3750.32	-390.61	320249.68	4254609.39	-44.53	2.82	948	-205	0.273	-0.19	11.08	89	312	0.817	ap37, crab pot, 3
Tr 7-21	-3406.44	-289.20	320593.56	4254710.80	-44.74	2.54	32	-37	0.134	0.25	1.29	1	305	0.919	ap40, good target, clutter 3m west, 1
Tr 7-22	-3141.56	-164.38	320858.44	4254835.62	-44.70	2.78	227	-27	0.186	0.11	3.48	55	238	0.135	not ap, crab pot, 3
Tr 7-23	-2957.55	-115.28	321042.45	4254884.72	-44.63	2.91	240	-39	0.213	-0.05	5.28	67	321	0.957	ap41, crab pot, 3
Tr 7-24	-2930.36	-115.42	321069.64	4254884.58	-44.61	2.98	518	-55	0.226	-0.31	6.24	88	90	0.958	ap42, crab pot, 3
Tr 7-25	-2765.80	-46.47	321234.20	4254953.53	-45.22	2.80	26	-15	0.158	0.56	2.15	13	308	0.822	ap43, part signature, 2
Tr 7-26	-2533.73	35.26	321466.27	4255035.26	-45.12	2.48	23	-18	0.175	0.81	2.89	-6	324	0.952	ap47, may not be crab pot, 1
Tr 7-27	-2453.70	46.33	321546.30	4255046.33	-44.47	2.56	176	-48	0.171	-0.03	2.70	31	126	0.898	ap49, inverted target on surface, 1
Tr 7-28	-2417.95	48.30	321582.05	4255048.30	-44.83	2.59	18	-5	0.103	0.42	0.59	46	30	0.650	ap50,small target, 2
Tr 7-29	-2376.45	47.65	321623.55	4255047.65	-44.33	2.68	228	-97	0.149	-0.4	1.80	71	112	0.563	ap51, boat anchor, 4
Tr 7-30	-2039.62	210.08	321960.38	4255210.08	-44.69	2.77	431	-30	0.265	0.19	10.09	53	151	0.350	not ap, good target, poor fit, 1
Tr 7-31	-1946.49	240.58	322053.51	4255240.59	-44.69	2.77	347	-50	0.228	0.08	6.45	77	64	0.898	ap52, crab pot, 3
Tr 7-32	-1865.57	268.17	322134.43	4255268.17	-45.12	2.78	18	-7	0.113	0.52	0.79	55	40	0.804	ap53, small target, too deep to dig?, 3
Tr 7-33	-1835.45	279.12	322164.55	4255279.12	-44.93	2.77	12	-3	0.083	0.32	0.31	87	304	0.746	ap54, very small target, 1
Tr 7-34	-912.84	601.74	323087.16	4255601.74	-45.26	3.22	234	-76	0.226	0.22	6.27	43	13	0.959	ap57, crab pot, 3
Tr 7-35	-902.06	607.14	323097.94	4255607.14	-45.22	3.27	53	-4	0.119	0.15	0.91	58	120	0.759	ap58, very good target, 1
Tr 7-36	-868.37	615.36	323131.63	4255615.36	-45.60	3.27	15	-18	0.125	0.43	1.06	-5	35	0.907	ap59, good small target, 1
Tr 7-37	-460.53	759.62	323539.47	4255759.62	-45.69	3.37	405	-82	0.260	0.41	9.54	34	127	0.903	ap60, very inverted, may not be crab pot, 2
Tr 7-38	-364.84	788.23	323635.16	4255788.23	-45.67	3.37	298	-22	0.213	0.5	5.28	89	90	0.944	ap61, crab pot, 3
Tr 7-39	-283.58	816.74	323716.42	4255816.74	-46.34	3.37	13	-7	0.105	1.12	0.63	77	270	0.837	ap62, small target, too deep to dig?, 2
Tr 7-40	-124.63	875.70	323875.37	4255875.70	-45.84	3.59	410	-86	0.261	0.38	9.64	52	336	0.931	ap63, crab pot, 3
Tr 7-41	138.40	962.91	324138.40	4255962.91	-45.59	2.85	335	-40	0.227	0.93	6.35	78	37	0.977	ap64, crab pot, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 9
Tue Oct 23 18:01:35 2007
SITE: Transect_9
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83
THIRD COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 9-1	-6012.97	-1320.28	317987.03	4253679.72	-44.23	2.47	10	-17	0.093	-0.13	0.44	3	144	0.833	ap1, 2
Tr 9-2	-5981.15	-1310.79	318018.85	4253689.21	-44.66	2.56	52	-19	0.175	0.25	2.92	33	212	0.971	ap2, 1
Tr 9-3	-5948.43	-1301.10	318051.57	4253698.90	-44.05	2.72	333	-361	0.279	-0.46	11.75	0	332	0.781	ap3, complex, multiple targets, 3
Tr 9-4	-5817.02	-1252.24	318182.98	4253747.76	-44.57	2.77	22	-7	0.120	0.02	0.93	26	65	0.819	ap5, 1
Tr 9-5	-5731.64	-1217.33	318268.36	4253782.67	-44.43	2.78	11	-4	0.078	-0.14	0.26	58	15	0.863	ap7, 2
Tr 9-6	-5716.23	-1213.66	318283.76	4253786.34	-45.19	2.77	9	-7	0.124	0.62	1.03	25	125	0.905	not ap, 1
Tr 9-7	-5707.74	-1209.61	318292.26	4253790.39	-44.48	2.78	88	-122	0.211	-0.08	5.11	-4	319	0.961	ap9, 2
Tr 9-8	-5458.54	-1125.88	318541.46	4253874.12	-45.13	3.01	72	-42	0.221	0.31	5.86	15	74	0.986	ap11, 1
Tr 9-9	-5421.49	-1111.28	318578.51	4253888.72	-44.89	3.05	249	-256	0.328	0.05	19.11	7	300	0.860	ap12, 1
Tr 9-10	-5414.60	-1111.73	318585.40	4253888.27	-44.81	3.01	89	-14	0.177	0.02	3.02	24	19	0.755	ao13,jpart signature, 1
Tr 9-11	-5409.75	-1109.47	318590.25	4253890.53	-44.67	2.99	14	-7	0.085	-0.11	0.34	63	309	0.845	ap14, 1
Tr 9-12	-5349.52	-1086.90	318650.48	4253913.10	-45.74	2.78	17	-14	0.141	1.18	1.54	62	138	0.461	ap15, cluster of junk, 4
Tr 9-13	-5345.77	-1085.67	318654.23	4253914.33	-45.11	2.77	14	-8	0.123	0.55	1.00	0	15	0.859	ap16, part of junk cluster, 3
Tr 9-14	-5283.31	-1062.08	318716.69	4253937.92	-44.74	2.77	29	-2	0.105	0.18	0.63	80	49	0.935	ap17, 1
Tr 9-15	-5253.08	-1050.23	318746.92	4253949.77	-44.79	2.77	10	-4	0.086	0.22	0.35	36	79	0.877	ap19, 2
Tr 9-16	-5244.44	-1046.64	318755.56	4253953.36	-45.07	2.77	18	-3	0.116	0.49	0.84	23	248	0.663	ap20, looks like junk, 4
Tr 9-17	-5213.16	-1038.88	318786.84	4253961.12											not ap, wont fit, crab trap, 3
Tr 9-18	-4971.41	-952.40	319028.59	4254047.60	-49.29	2.78	17	-19	0.411	4.75	37.70	-12	98	0.891	ap22, junk, 4
Tr 9-19	-4951.71	-947.28	319048.29	4254052.72	-45.37	2.78	45	-15	0.175	0.83	2.91	3	245	0.621	ap23, junk, 4
Tr 9-20	-4924.56	-938.42	319075.44	4254061.58	-44.69	2.77	14	-7	0.089	0.13	0.39	38	286	0.765	ap24, 1
Tr 9-21	-4904.49	-931.42	319095.51	4254068.58	-45.06	2.78	13	-5	0.107	0.49	0.66	29	43	0.860	ap25, 1
Tr 9-22	-4854.01	-911.07	319145.99	4254088.93	-45.04	2.78	16	-7	0.107	0.46	0.67	51	19	0.890	ap26, 1
Tr 9-23	-4519.88	-792.93	319480.12	4254207.07	-44.89	2.85	29	-2	0.088	0.19	0.37	89	90	0.785	ap31, 3
Tr 9-24	-4514.49	-790.62	319485.51	4254209.38	-45.96	2.78	11	-9	0.160	1.26	2.21	7	76	0.929	ap32, 3
Tr 9-25	-4437.01	-777.77	319562.99	4254222.23	-44.57	2.29	52	-41	0.166	0.46	2.48	15	54	0.892	ap not, 2
Tr 9-26	-4325.45	-732.84	319674.55	4254267.16	-45.32	3.18	36	-43	0.151	0.31	1.85	-9	215	0.966	ap35, 2
Tr 9-27	-4307.72	-723.29	319692.28	4254276.71	-45.48	3.25	36	-24	0.152	0.44	1.92	-8	138	0.850	ap37, 3
Tr 9-28	-4268.60	-708.16	319731.40	4254291.84	-45.25	3.29	30	-23	0.123	0.13	1.02	1	183	0.918	ap38, multiple targets, 4
Tr 9-29	-4251.47	-699.46	319748.53	4254300.54	-45.38	3.32	12	-5	0.095	0.22	0.47	28	332	0.871	ap39, 1
Tr 9-30	-4176.96	-678.95	319823.04	4254321.05	-45.59	3.16	26	-20	0.159	0.61	2.17	5	301	0.810	ap43, looks like junk, 4
Tr 9-31	-4158.54	-675.54	319841.46	4254324.46	-45.21	3.16	30	-21	0.125	0.2	1.06	20	222	0.701	ap45, 3
Tr 9-32	-4150.17	-671.84	319849.83	4254328.16	-45.63	3.16	51	-19	0.169	0.68	2.61	39	299	0.694	ap46, at least 3 targets, 4
Tr 9-33	-4111.49	-658.60	319888.51	4254341.40	-45.12	3.12	7	-13	0.082	0.13	0.30	-19	54	0.892	very small inverted target, 3
Tr 9-34	-4078.72	-644.77	319921.28	4254355.23											
Tr 9-35	-4075.49	-644.04	319924.51	4254355.97	-45.95	3.02	19	-3	0.113	1.05	0.78	50	178	0.642	ap49, looks like junk, 4
Tr 9-36	-4051.02	-633.05	319948.98	4254366.95	-45.91	2.97	10	-7	0.132	1.14	1.26	11	78	0.799	ap 50 looks like junk, 4
Tr 9-37	-3982.64	-624.59	320017.36	4254375.41	-56.05	2.42	12	-11	0.696	11.75	183.12	11	137	0.666	not ap, part signal, poor fit, crab pot?, 3
Tr 9-38	-3919.24	-600.76	320080.76	4254399.24	-44.16	2.26	6	-9	0.044	-0.14	0.05	12	345	0.792	ap53, 2
Tr 9-39	-3912.12	-599.04	320087.88	4254400.96	-44.22	2.27	22	-23	0.125	0.08	1.05	12	297	0.973	ap54, part signal, 3
Tr 9-40	-3908.86	-593.22	320091.14	4254406.78	-44.29	2.25	17	-9	0.094	0.24	0.45	35	39	0.868	ap55, small target, remnant moment, 1

Transect 9, Continued

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 9-41	-3874.42	-572.32	320125.58	4254427.69	-44.80	2.41	34	-5	0.122	0.54	0.98	60	99	0.896	ap57, crab trap?, 3
Tr 9-42	-3844.78	-552.73	320155.22	4254447.27	-44.54	2.67	11	-7	0.085	0.07	0.33	33	231	0.838	ap59, small target, 2
Tr 9-43	-3832.61	-548.37	320167.39	4254451.64	-44.66	2.71	13	-23	0.109	0.1	0.70	-18	359	0.946	ap61, large remnant, 3
Tr 9-44	-3829.60	-545.68	320170.40	4254454.32	-44.73	2.74	13	-4	0.081	0.14	0.29	47	74	0.870	not ap, small target, 1
Tr 9-45	-3818.39	-543.10	320181.61	4254456.90	-46.90	2.81	18	-13	0.197	2.25	4.17	69	250	0.648	ap62, two targets, 3
Tr 9-46	-3778.76	-528.60	320221.24	4254471.40	-45.86	2.85	26	-16	0.170	1.16	2.68	20	110	0.540	ap63, cluster of stuff, anchor?, 4
Tr 9-47	-3769.49	-525.58	320230.51	4254474.42	-44.82	2.84	27	-26	0.147	0.13	1.72	-3	307	0.915	ap64, remnant moment, 2
Tr 9-48	-3746.36	-522.38	320253.64	4254477.62	-44.78	2.8	14	-3	0.083	0.16	0.31	74	82	0.734	ap65, looks like clutter, 3
Tr 9-49	-3739.02	-519.63	320260.98	4254480.37	-44.61	2.79	38	-38	0.138	-0.02	1.44	-10	166	0.981	ap66, completely inverted, 2
Tr 9-50	-3727.56	-518.50	320272.44	4254481.50	-45.71	2.78	20	-24	0.188	1.11	3.60	17	20	0.608	ap68, pile of clutter, 4
Tr 9-51	-3725.82	-515.05	320274.18	4254484.95	-44.73	2.78	16	-19	0.114	0.15	0.81	2	75	0.775	not ap, clutter pile, 4
Tr 9-52	-3714.99	-514.68	320285.01	4254485.32	-44.62	2.76	13	-5	0.085	0.04	0.33	11	256	0.866	ap69, small target, 2
Tr 9-53	-3707.53	-509.89	320292.47	4254490.11	-44.64	2.74	27	-14	0.112	0.11	0.76	29	73	0.589	not ap, 2
Tr 9-54	-3704.97	-511.10	320295.03	4254488.90	-45.83	2.74	17	-14	0.169	1.28	2.63	3	72	0.827	not ap, clutter, 4
Tr 9-55	-3680.17	-506.47	320319.83	4254493.53	-45.09	2.71	16	-17	0.144	0.55	1.62	1	239	0.805	ap70, clutter 4
Tr 9-56	-3674.70	-504.55	320325.30	4254495.45	-44.43	2.72	10	-5	0.076	-0.07	0.24	26	334	0.887	ap71, small target, 3
Tr 9-57	-3662.98	-499.38	320337.02	4254500.62	-45.17	2.72	11	-1	0.089	0.58	0.38	84	1	0.865	ap72, 2
Tr 9-58	-3616.76	-480.20	320383.24	4254519.80	-44.72	2.78	76	-11	0.157	0.13	2.12	28	181	0.864	ap74, inverted, crab trap?, 2
Tr 9-59	-3470.00	-424.46	320530.00	4254575.54	-45.13	2.66	25	-14	0.127	0.64	1.12	90	5	0.893	ap80, possible anchor, 1
Tr 9-60	-3467.20	-423.44	320532.80	4254576.56	-44.51	2.65	20	-12	0.090	0	0.40	24	316	0.814	not ap, paired with targ 59, 1
Tr 9-61	-3426.89	-409.46	320573.11	4254590.54	-44.75	2.76	10	-13	0.100	0.15	0.54	-6	8	0.876	ap81, looks like clutter, 4
Tr 9-62	-3387.42	-391.75	320612.58	4254608.25	-44.97	2.77	25	-8	0.117	0.37	0.88	52	173	0.561	not ap, good target, 1
Tr 9-63	-3348.44	-380.87	320651.56	4254619.13	-45.21	2.75	15	-8	0.111	0.63	0.75	36	26	0.626	ap82, 2
Tr 9-64	-2771.54	-182.68	321228.46	4254817.32											
Tr 9-65	-2768.70	-179.55	321231.30	4254820.45	-44.63	2.47	11	-11	0.112	0.31	0.77	-6	5	0.955	ap83, 2
Tr 9-66	-2763.43	-179.26	321236.57	4254820.74	-44.64	2.46	14	-7	0.100	0.31	0.54	21	1	0.902	ap84, 3
Tr 9-67	-2743.98	-168.83	321256.02	4254831.18	-44.95	2.56	69	-9	0.184	0.58	3.39	80	258	0.791	not ap, crab trap?, 3
Tr 9-68	-2714.08	-163.34	321285.92	4254836.66	-44.60	2.64	14	-6	0.099	0.14	0.52	26	232	0.925	ap85, 2
Tr 9-69	-2688.90	-155.46	321311.10	4254844.54	-44.92	2.7	21	-19	0.150	0.37	1.84	7	327	0.948	ap86, crab trap?, 3
Tr 9-70	-2684.22	-155.25	321315.78	4254844.76	-44.50	2.7	16	-4	0.086	0.13	0.35	64	171	0.711	ap87, 3
Tr 9-71	-2581.99	-100.06	321418.01	4254899.94	-44.44	2.57	14	-7	0.084	0.04	0.32	29	222	0.833	ap88, 2
Tr 9-72	-2572.03	-95.71	321427.97	4254904.29	-44.69	2.58	15	-8	0.109	0.27	0.70	24	83	0.858	ap89, 2
Tr 9-73	-2538.17	-81.48	321461.83	4254918.52	-44.86	2.61	21	-23	0.121	0.42	0.97	-87	170	0.641	ap91. part signature, 4
Tr 9-74	-2492.33	-71.79	321507.67	4254928.21	-44.70	2.7	13	-5	0.098	0.18	0.50	29	239	0.793	ap94, clutter, 4
Tr 9-75	-2475.87	-70.41	321524.13	4254929.59	-45.07	2.72	89	-7	0.215	0.56	5.40	49	251	0.960	ap95, great target, crab pot?, 3
Tr 9-76	-2452.69	-70.23	321547.31	4254929.77	-45.10	2.74	13	-11	0.139	0.6	1.45	19	43	0.803	ap96, clutter, 4
Tr 9-77	-2450.16	-71.91	321549.84	4254928.10	-44.34	2.73	14	-5	0.083	-0.18	0.31	35	30	0.849	p97, clutter, 3
Tr 9-78	-2293.88	-13.46	321706.12	4254986.54	-44.45	2.74	120	-8	0.157	-0.18	2.10	57	153	0.469	ap100, crab pot?, 3
Tr 9-79	-2061.18	61.16	321938.82	4255061.16	-44.56	2.78	15	-12	0.106	0	0.65	10	282	0.709	ap102, 1
Tr 9-80	-2052.14	65.63	321947.86	4255065.63	-44.46	2.78	177	-15	0.181	-0.15	3.24	79	130	0.750	ap103, crab trap, 3
Tr 9-81	-1773.34	175.35	322226.66	4255175.35	-44.81	2.77	119	-8	0.201	0.17	4.41	80	109	0.947	not ap, crab trap?, 3
Tr 9-82	-1323.99	324.93	322676.01	4255324.93	-44.87	3.07	250	-32	0.217	-0.04	5.57	71	51	0.985	ap104, crab trap?, 3
Tr 9-83	-1145.82	387.67	322854.18	4255387.67	-44.99	3.07	324	-58	0.236	0.12	7.17	58	88	0.985	ap105, crab trap?, 3
Tr 9-84	-1104.61	402.00	322895.39	4255402.00	-45.33	3.08	23	-20	0.145	0.45	1.66	-2	105	0.950	ap 106, part signature, 1
Tr 9-85	-1028.71	422.59	322971.29	4255422.59	-45.58	3.07	19	-9	0.133	0.66	1.28	33	59	0.546	not ap, part signature, 2
Tr 9-86	-995.81	437.12	323004.19	4255437.12	-45.01	3.07	11	-17	0.100	0.1	0.54	-3	335	0.879	ap 107, 1
Tr 9-87	-914.17	468.60	323085.83	4255468.60	-45.29	3.07	121	-10	0.180	0.32	3.14	53	156	0.970	ap105, crab trap?, 3
Tr 9-88	-585.28	577.74	323414.72	4255577.74	-45.72	3.37	46	-49	0.178	0.5	3.06	8	299	0.933	ap109, crab trap?, 3
Tr 9-89	79.16	812.69	324079.16	4255812.69	-45.78	3.42	151	-22	0.193	0.55	3.88	69	332	0.968	ap111, crab trap?, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 11

Sat Oct 27 10:16:59 2007
SITE: Transect_11
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83
THIRD COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						Analyst Comments
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Comments
Tr 11-1	-5733.55	-1385.29	318266.45	4253614.71	-47.57	2.72	17	-17	0.312	3.12	16.45	25	66	0.909	ap0, likely too big for crab trap, 2
Tr 11-2	-5628.89	-1347.04	318371.11	4253652.96	-44.89	2.75	6	-2	0.067	0.45	0.16	41	221	0.671	not ap, very small target, 1
Tr 11-3	-5371.70	-1240.92	318628.30	4253759.08	-45.42	2.57	24	-4	0.145	1.14	1.65	47	198	0.844	ap1, looks like a pile of clutter, 3
Tr 11-4	-5217.24	-1179.85	318782.76	4253820.15	-44.72	2.71	7	-12	0.093	0.34	0.43	-7	8	0.797	ap2, looks like clutter, 3
Tr 11-5	-5198.05	-1168.57	318801.95	4253831.44	-45.05	2.75	17	-10	0.124	0.58	1.05	10	331	0.862	ap3, 2
Tr 11-6	-5178.65	-1162.60	318821.35	4253837.40	-44.90	2.77	7	-4	0.074	0.42	0.22	35	209	0.863	not ap, very small target, 1
Tr 11-7	-4896.91	-1061.50	319103.09	4253938.51	-44.65	2.79	14	-17	0.102	0.19	0.58	-4	329	0.931	ap6, small target, 1
Tr 11-8	-4791.62	-1027.97	319208.38	4253972.03	-45.06	2.90	13	-13	0.116	0.44	0.84	3	9	0.829	ap7, part signature, 2
Tr 11-9	-4698.66	-994.83	319301.34	4254005.17	-45.13	3.00	15	-7	0.103	0.41	0.59	25	328	0.836	ap8, small target in clutter, 1
Tr 11-10	-4671.72	-985.83	319328.28	4254014.17	-45.22	3.04	20	-23	0.135	0.44	1.34	11	6	0.849	ap9, good target, 1
Tr 11-11	-4624.51	-971.05	319375.49	4254028.95	-44.79	3.13	7	-11	0.079	0.01	0.27	-4	19	0.836	ap10, does not liik like uxo, 3
Tr 11-12	-4526.61	-939.32	319473.39	4254060.68	-45.23	3.31	31	-13	0.126	0.19	1.08	10	175	0.890	ap11, looks like multiple targets, 3
Tr 11-13	-4494.05	-930.87	319505.95	4254069.14	-45.23	3.37	10	-4	0.070	0.13	0.18	45	103	0.754	not ap, very small target, 1
Tr 11-14	-4303.72	-863.42	319696.28	4254136.58	-45.55	3.37	68	-47	0.177	0.41	2.98	7	253	0.935	ap13, crab pot, 3
Tr 11-15	-4221.74	-818.16	319778.26	4254181.84	-45.21	3.37	61	-64	0.172	0.09	2.77	4	305	0.982	ap17, crab pot, 3
Tr 11-16	-4166.90	-799.85	319833.10	4254200.15	-45.48	3.35	11	-15	0.117	0.39	0.86	-15	276	0.890	not ap, small target, 1
Tr 11-17	-3993.69	-748.92	320006.31	4254251.08	-44.36	2.27	50	-63	0.162	0.31	2.29	-6	257	0.757	ap26, inverted, 1
Tr 11-18	-3913.31	-717.82	320086.69	4254282.18	-45.17	2.81	23	-13	0.117	0.6	0.87	22	355	0.800	ap34, other targets too close, 2
Tr 11-19	-3900.15	-713.48	320099.85	4254286.52	-45.55	2.74	40	-17	0.160	1.04	2.24	29	110	0.920	ap36, inverted signal, 1
Tr 11-20	-3492.91	-564.88	320507.09	4254435.12	-44.77	2.70	16	-5	0.095	0.29	0.47	37	192	0.788	ap58, very small target, 1
Tr 11-21	-3374.58	-528.69	320625.42	4254471.31	-44.53	2.72	10	-5	0.075	0.06	0.23	6	190	0.680	ap62, very small target, 1
Tr 11-22	-2832.69	-334.14	321167.31	4254665.86	-45.13	2.49	22	-6	0.129	0.77	1.18	38	264	0.884	ap84, small target, too deep?, 2
Tr 11-23	-2621.04	-267.42	321378.96	4254732.58	-44.36	2.48	301	-152	0.236	0.12	7.16	23	13	0.962	ap77, crab pot, 2
Tr 11-24	-2521.19	-229.51	321478.81	4254770.49	-44.72	2.52	19	-3	0.100	0.43	0.54	51	240	0.840	ap79, small target, 1
Tr 11-25	-2395.54	-186.28	321604.46	4254813.73	-44.67	2.48	55	-54	0.185	0.42	3.45	4	63	0.977	ap83, small for crab pot, 3
Tr 11-26	-2204.36	-102.20	321795.64	4254897.80	-44.48	2.66	600	-89	0.224	-0.31	6.12	34	145	0.949	ap86, multiple targets, 2
Tr 11-27	-2194.27	-102.37	321805.73	4254897.63	-45.01	2.70	14	-15	0.135	0.63	1.33	13	327	0.866	ap87, small target, too deep?, 2
Tr 11-29	-1435.95	148.29	322564.05	4255148.29	-45.37	3.06	24	-4	0.112	0.42	0.76	80	90	0.864	ap68, small target, 1
Tr 11-30	-756.23	388.61	323243.77	4255388.61	-45.43	3.33	78	-13	0.133	0.27	1.28	78	90	0.619	ap90, excellent target, 1
Tr 11-31	-604.94	435.03	323395.06	4255435.03	-45.83	3.37	9	-6	0.082	0.55	0.30	50	172	0.598	not ap, very small target, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 13

Tue Oct 23 18:03:05 2007
SENSOR: mmag
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83
THIRD COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						Analyst Comments
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	
Tr 13-1	-6226.94	-1653.40	317773.06	4253346.60	-44.76	2.4	15	-11	0.123	0.5	1.02	20	42	0.931	ap1, 1
Tr 13-2	-6190.14	-1641.59	317809.86	4253358.41	-45.75	2.4	15	-11	0.197	1.5	4.14	20	80	0.863	ap3, looks like trash pile, 3
Tr 13-3	-6079.54	-1608.60	317920.46	4253391.40	-44.17	2.5	10	-5	0.072	-0.2	0.20	41	346	0.806	ap4, very small target, 1
Tr 13-4	-6030.70	-1591.33	317969.30	4253408.67	-44.26	2.5	90	-24	0.163	-0.1	2.36	36	327	0.771	ap6, crab trap?, 3
Tr 13-5	-6007.32	-1579.94	317992.68	4253420.07	-44.41	2.4	159	-76	0.234	0.1	6.92	27	303	0.961	ap7, crab trap?, 3
Tr 13-6	-5979.16	-1572.36	318020.84	4253427.64	-44.66	2.4	185	-57	0.230	0.4	6.60	35	75	0.987	ap8, crap trap? 3
Tr 13-7	-5941.28	-1557.71	318058.72	4253442.29	-45.22	2.5	274	-18	0.338	0.9	20.94	61	272	0.848	ap9, much bigger than your average crab trap, 3
Tr 13-8	-5778.72	-1501.69	318221.28	4253498.31	-45.65	2.6	35	-13	0.215	1.2	5.37	26	74	0.945	ap10, does not look like UXO, 3
Tr 13-9	-5481.69	-1398.01	318518.31	4253601.99	-44.42	2.0	12	-6	0.083	0.6	0.31	77	90	0.760	ap12, good small target, 1
Tr 13-10	-5202.58	-1309.24	318797.42	4253690.76	-45.21	2.8	12	-6	0.100	0.6	0.54	90	210	0.825	ap14, good small target, 1
Tr 13-11	-4653.52	-1122.30	319346.48	4253877.70	-45.45	3.3	11	-4	0.097	0.3	0.50	18	341	0.733	ap16, good small target, 1
Tr 13-12	-4405.09	-1019.29	319594.91	4253980.71	-44.71	3.4	513	-49	0.232	-0.4	6.77	63	342	0.888	ap17, likely not crab trap, 1
Tr 13-13	-4296.04	-980.58	319703.96	4254019.42	-45.11	3.3	11	-23	0.127	-0.1	1.10	-10	16	0.920	ap18, 2
Tr 13-14	-4289.54	-979.49	319710.46	4254020.51	-45.55	3.3	11	-6	0.107	0.4	0.67	73	348	0.746	ap19, 2
Tr 13-15	-4113.99	-917.82	319886.01	4254082.18	-45.11	3.1	21	-5	0.118	0.2	0.90	32	300	0.760	ap20, 2
Tr 13-16	-3806.21	-807.80	320193.79	4254192.20	-45.12	3.1	39	-9	0.131	0.2	1.22	60	80	0.484	not ap, 2
Tr 13-17	-3610.49	-735.14	320389.51	4254264.86	-44.48	2.9	9	-11	0.082	-0.3	0.30	-5	241	0.834	ap21, very small target, 2
Tr 13-18	-3516.27	-707.04	320483.73	4254292.96	-44.77	2.8	47	-32	0.161	0.1	2.27	9	27	0.850	ap22, good target, 1
Tr 13-19	-3489.32	-698.84	320510.68	4254301.16	-44.69	2.8	17	-18	0.115	0.0	0.83	5	86	0.892	ap23, 1
Tr 13-20	-3239.32	-607.24	320760.68	4254392.76	-45.20	2.7	40	-49	0.213	0.6	5.22	4	331	0.744	ap27, 1
Tr 13-21	-3140.28	-586.76	320859.72	4254413.24	-44.37	2.8	10	-12	0.083	-0.3	0.31	-11	175	0.847	ap28, 3
Tr 13-22	-3118.80	-581.32	320881.20	4254418.68	-44.56	2.8	324	-10	0.227	-0.1	6.31	63	178	0.697	ap29, crab trap?, 3
Tr 13-23	-2698.47	-425.91	321301.53	4254574.09	-44.36	2.5	494	-17	0.231	0.0	6.67	43	174	0.142	not ap, good target, poor fit, 2
Tr 13-24	-2481.95	-364.17	321518.05	4254635.83	-44.59	2.8	346	-71	0.246	-0.1	8.03	28	201	0.958	ap30, remnant moment, 2
Tr 13-25	-2261.85	-298.17	321738.15	4254701.83	-44.55	2.6	33	-29	0.130	0.1	1.20	6	269	0.976	ap32, 1
Tr 13-26	-1851.58	-130.23	322148.42	4254869.77	-44.88	2.8	74	-6	0.163	0.2	2.34	61	134	0.931	ap34, crab trap?, 3
Tr 13-27	-859.58	220.89	323140.42	4255220.89	-45.29	3.3	181	-15	0.197	0.1	4.17	80	359	0.978	ap37, crab trap?, 3
Tr 13-28	-831.18	229.17	323168.82	4255229.17	-45.34	3.2	139	-118	0.227	0.2	6.32	7	271	0.982	ap38, crab trap?, 3
Tr 13-29	-492.51	334.13	323507.49	4255334.14	-46.25	3.4	34	-5	0.146	0.9	1.69	90	90	0.845	ap?, crap trap?, 3
Tr 13-30	287.12	623.14	324287.12	4255623.14	-45.78	3.7	11	-4	0.075	0.2	0.23	83	90	0.695	ap45, small target, 2
Tr 13-31	303.96	631.29	324303.96	4255631.29	-45.43	3.7	246	-8	0.190	-0.2	3.72	55	191	0.237	ap46, crab trap?, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT, 14

Sun Oct 28 13:25:27 2007
SITE: Transect_14
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 14-1	-5739.02	-1624.81	318260.98	4253375.19	-44.55	2.47	143	-94	0.224	0.42	6.13	19	2	0.976	ap 0, crab pot, 3
Tr 14-2	-5360.11	-1457.02	318639.89	4253542.98	-44.67	2.49	483	-229	0.263	0.57	9.88	24	22	0.983	ap 2, crab pot, 3
Tr 14-3	-5133.77	-1410.65	318866.23	4253589.35	-44.80	3.07	224	-63	0.202	0.06	4.48	34	12	0.816	ap 3, crab pot, 3
Tr 14-4	-4989.85	-1360.79	319010.15	4253639.21	-45.26	3.11	78	-7	0.150	0.50	1.83	70	289	0.884	ap 4, crab pot, 3
Tr 14-5	-4983.14	-1358.39	319016.86	4253641.61	-45.19	3.10	8	-5	0.074	0.40	0.22	29	289	0.581	not ap, very small target, 1
Tr 14-6	-4971.02	-1353.75	319028.98	4253646.25	-45.07	3.09	13	-7	0.076	0.37	0.24	35	71	0.636	not ap, very small target, 1
Tr 14-7	-4731.82	-1256.45	319268.18	4253743.55	-46.00	3.36	13	-7	0.120	1.00	0.94	56	11	0.458	not ap, looks like clutter, 3
Tr 14-8	-4580.88	-1205.99	319419.12	4253794.02	-45.75	3.08	11	-3	0.107	1.02	0.66	43	10	0.831	not ap, small target, too deep?, 1
Tr 14-9	-4335.20	-1129.47	319664.80	4253870.53	-47.57	3.15	24	-10	0.250	2.79	8.47	41	49	0.464	ap 7, crab pot, 3
Tr 14-10	-3980.85	-1006.38	320019.15	4253993.63	-44.75	2.93	40	-36	0.136	0.16	1.36	1	177	0.965	ap 9, inverted, dig this, 1
Tr 14-11	-3748.52	-920.31	320251.48	4254079.69	-44.75	2.61	83	-6	0.140	0.53	1.48	58	165	0.648	ap11, small crab pot, 2
Tr 14-12	-2471.48	-477.66	321528.52	4254522.34	-45.15	2.40	229	-65	0.299	1.01	14.44	25	65	0.620	ap17, crab pot, 3
Tr 14-13	-2064.62	-331.51	321935.38	4254668.49	-45.37	2.84	18	-4	0.107	0.80	0.66	75	238	0.713	ap19, too small for crab pot, too deep?, 1
Tr 14-14	-678.60	153.80	323321.40	4255153.80	-45.67	3.07	69	-10	0.162	0.86	2.31	62	255	0.915	ap24, small crab pot, 2
Tr 14B-1	-8840.46	-2708.28	315159.54	4252291.72	-47.25	5.05	9.3	-5	0.083	0.68	0.31	30	27	0.723	not ap, very small target, too deep? 1
Tr 14B-2	-8061.45	-2429.64	315938.55	4252570.36	-45.53	2.71	8.5	-9	0.137	1.22	1.39	1	317	0.893	ap1, small target, too deep?, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 15

Tue Oct 23 18:04:18 2007
SENSOR: mmag
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 15-1	-6089.88	-1882.36	317910.12	4253117.64	-44.0	1.90	14	-7	0.077	0.34	0.25	16	168	0.874	ap0, very small target, 1
Tr 15-2	-5681.93	-1731.57	318318.07	4253268.43	-44.7	2.60	33	-12	0.128	0.42	1.13	52	338	0.859	ap1, good small target, 1
Tr 15-3	-4663.70	-1376.33	319336.30	4253623.67	-45.2	3.07	9	-4	0.085	0.41	0.33	83	10	0.768	not ap, good very small target, 1
Tr 15-4	-4303.25	-1253.86	319696.75	4253746.14	-45.4	2.88	12	-5	0.116	0.76	0.85	50	353	0.814	ap4, 2
Tr 15-5	-4285.77	-1253.73	319714.23	4253746.27	-45.3	2.96	11	-11	0.137	0.62	1.39	8	17	0.877	ap5, part signature, 2
Tr 15-6	-3684.96	-1034.18	320315.04	4253965.82	-46.0	3.31	24	-22	0.152	0.86	1.92	85	335	0.667	ap7, too deep?, 2
Tr 15-7	-3604.73	-1005.74	320395.27	4253994.26	-44.6	3.33	50	-40	0.102	-0.51	0.58	-90	90	0.232	ap10, may be anchor, 4
Tr 15-8	-3543.84	-983.74	320456.16	4254016.26	-44.7	3.09	360	-380	0.257	-0.21	9.18	8	48	0.835	ap12, looks like junk, 4
Tr 15-9	-3413.96	-941.13	320586.04	4254058.87	-47.9	3.30	25	-8	0.317	2.86	17.37	9	65	0.862	ap13, looks like clutter, 4
Tr 15-10	-2841.72	-736.86	321158.28	4254263.15	-45.3	3.44	260	-31	0.209	-0.03	4.96	68	241	0.948	ap15, crab trap?, 3
Tr 15-11	-2501.58	-618.18	321498.42	4254381.82	-45.2	3.35	30	-27	0.136	0.08	1.37	2	72	0.954	ap18, dig this, 1
Tr 15-12	-1769.91	-361.02	322230.09	4254638.98	-44.9	3.07	296	-18	0.223	0.01	6.01	76	172	0.857	ap19, crab trap, 3
Tr 15-13	-1701.08	-333.89	322298.92	4254666.11	-44.9	2.90	85	-17	0.157	0.22	2.08	44	89	0.224	ap20, good target, 1
Tr 15-14	-1637.93	-312.44	322362.07	4254687.56	-45.3	2.79	62	-60	0.224	0.71	6.10	5	7	0.782	ap21, crab trap?, 3
Tr 15-15	-538.83	71.88	323461.17	4255071.88	-45.5	3.37	40	-51	0.170	0.39	2.67	-1	338	0.969	ap26, good target, 1
Tr 15-16	-410.66	114.43	323589.34	4255114.43	-45.2	3.59	529	-63	0.222	-0.16	5.96	66	275	0.635	ap27, looks like anchor, 4
Tr 15-17	-301.21	142.60	323698.79	4255142.60	-45.5	3.38	98	-39	0.174	0.47	2.88	38	18	0.969	ap28, crab trap?, 3
Tr 15-18	-260.92	167.93	323739.08	4255167.93	-45.9	3.49	82	-30	0.183	0.56	3.32	35	62	0.983	ap30, crab trap?, 3
Tr 15-19	-201.71	190.51	323798.29	4255190.51	-46.0	3.67	13	-7	0.089	0.43	0.39	71	51	0.639	ap31, small target, 1
Tr 15-20	-186.29	195.16	323813.71	4255195.16	-45.8	3.67	63	-38	0.194	0.35	3.93	4	19	0.962	ap32, crab trap?, 3
Tr 15-21	-100.17	216.42	323899.83	4255216.42	-45.7	3.57	19	-24	0.120	0.42	0.93	-2	255	0.916	ap33, inverted small target, 1
Tr 15-22	197.40	332.20	324197.40	4255332.20	-46.6	3.67	93	-93	0.280	1.14	11.97	5	43	0.708	ap37, looks like an anchor, 4
Tr 15B-1	-10295.84	-3465.42	313704.16	4251534.58	-44.61	2.81	79	-69	0.247	0.17	8.1356	1	103	0.917	ap 0, may not be crab pot, 1
Tr 15B-2	-10264.97	-3419.99	313735.03	4251580.01	-43.95	2.43	50	-12	0.129	0.10	1.1680	58	51	0.412	not ap, good target, 1
Tr 15B-3	-9358.14	-3016.82	314641.86	4251983.18	-47.86	5.61	16	-5	0.096	0.71	0.4738	74	178	0.825	ap 3, good small target, too deep?, 1
Tr 15B-4	-9190.09	-2957.01	314809.90	4252043.00	-48.22	5.71	31	-37	0.184	0.88	3.3590	4	36	0.965	ap 4, crab pot?, 2
Tr 15B-5	-9154.41	-2947.10	314845.59	4252052.90	-48.33	5.81	245	-20	0.280	0.91	11.8599	66	25	0.926	ap 5, cra pot, 3
Tr 15B-6	-9112.45	-2934.63	314887.55	4252065.37	-48.09	5.88	39	-32	0.163	0.62	2.3665	7	48	0.952	ap6, crab pot, 3
Tr 15B-7	-8542.00	-2735.91	315458.00	4252264.09	-48.49	6.18	91	-19	0.199	0.67	4.2497	49	281	0.971	ap 9, crab pot, 3
Tr 15B-8	-7579.31	-2393.47	316420.69	4252606.53	-44.55	2.49	21	-28	0.136	0.42	1.3800	3	307	0.941	ap 12, good target, 2nd target 3 m SW, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 16
Sun Oct 28 13:28:14 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 16-1	-5617.75	-1840.32	318382.25	4253159.68	-45.17	2.83	57	-7	0.160	0.61	2.2300	84	174	0.897	not ap, smaller than crab pot?, 1
Tr 16-2	-4235.21	-1356.29	319764.79	4253643.71	-45.45	3.43	11	-21	0.111	0.22	0.7397	-11	70	0.910	ap1, inverted signal, 1
Tr 16-3	-4141.37	-1326.49	319858.63	4253673.51	-46.06	3.31	15	-6	0.128	1.11	1.1315	79	67	0.874	ap3, good target, too deep?, 1
Tr 16-4	-3283.66	-1027.40	320716.34	4253972.60	-45.81	3.84	44	-39	0.162	0.29	2.3080	0	243	0.932	ap5, inverted, small for crab pot, 1
Tr 16-5	-3087.28	-955.49	320912.72	4254044.51	-46.96	4.61	91	-20	0.243	0.64	7.7787	21	217	0.818	ap6, crab pot, 3
Tr 16-6	-1957.18	-558.02	322042.82	4254441.98	-46.55	4.81	60	-25	0.159	0.07	2.1732	15	254	0.793	ap 8, small crab pot?, 2
Tr 16-7	-1198.46	-291.35	322801.54	4254708.65	-45.14	2.77	96	-6	0.167	0.65	2.5235	54	183	0.428	not ap, small for crab pot, too deep?, 2
Tr 16-8	-973.10	-212.03	323026.90	4254787.97	-45.45	3.04	11	-13	0.133	0.67	1.2883	-6	313	0.844	not ap, small target, too deep?, 1
Tr 16-9	-623.98	-93.32	323376.02	4254906.68	-45.47	3.31	116	-55	0.200	0.45	4.3672	10	212	0.871	ap 11, inverted target crab pot?, 3
Tr 16-10	-334.75	17.95	323665.25	4255017.95	-45.59	3.57	13	-9	0.064	0.04	0.1399	26	24	0.841	ap 12, very small target, 1
Tr 16-11	46.06	145.41	324046.06	4255145.42	-45.86	3.67	352	-106	0.273	0.49	11.1038	29	322	0.942	ap 13, crab pot, 3
Tr 16B-1	-9948.88	-3364.50	314051.12	4251635.50	-48.10	5.89	19	-26	0.119	0.67	0.9232	4	338	0.847	ap 0, small target, too deep?, 1
Tr 16B-2	-9899.77	-3345.92	314100.23	4251654.08	-48.26	6.10	56	-7	0.138	0.63	1.4288	43	157	0.967	ap1, small target, too deep?, 1
Tr 16B-3	-9706.36	-3272.55	314293.64	4251727.45	-48.83	6.67	10	-4	0.074	0.66	0.2159	58	216	0.805	not ap, very small target, too deep?, 1
Tr 16B-4	-9655.14	-3255.68	314344.86	4251744.32	-48.95	6.81	23	-5	0.105	0.60	0.6241	48	11	0.934	ap2, good small target, too deep?, 1
Tr 16B-5	-9107.86	-3062.67	314892.14	4251937.33	-48.61	6.56	571	-105	0.268	0.48	10.4100	56	318	0.943	ap 3, crab pot, 3
Tr 16B-6	-7807.19	-2606.99	316192.81	4252393.01	-50.01	7.50	20	-16	0.124	0.91	1.0329	-4	102	0.858	ap 9, inverted small target, too deep?, 1
Tr 16B-7	-7552.98	-2523.30	316447.02	4252476.70	-49.02	6.01	22	-26	0.123	1.42	1.0151	-9	171	0.905	ap 10, inverted small target, too deep?, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 17
Tue Oct 23 18:05:50 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 17-1	-5820.40	-2011.29	318179.60	4252988.71	-44.82	2.73	-13	9	0.092	0.28	0.43	-13	326	0.938	ap0, good small target, 1
Tr 17-2	-5812.24	-2014.26	318187.76	4252985.74	-44.68	2.75	-20	242	0.194	0.18	3.97	84	40	0.917	ap1, crab trap, 3
Tr 17-3	-5685.42	-1998.95	318314.58	4253001.05	-45.07	3.02	-14	11	0.113	0.35	0.79	-3	223	0.904	ap3, inverted small target, 1
Tr 17-4	-5418.41	-1893.73	318581.59	4253106.27	-45.52	3.37	-5	9	0.092	0.44	0.42	4	104	0.487	not ap, small target, 1
Tr 17-5	-5028.54	-1765.07	318971.46	4253234.93	-45.35	3.09	-12	59	0.164	0.59	2.39	82	323	0.917	ap4, good target, 1
Tr 17-6	-4898.55	-1723.60	319101.45	4253276.40	-45.27	3.34	-45	208	0.245	0.27	7.98	50	11	0.987	ap5, crab trap, 3
Tr 17-7	-4866.71	-1714.58	319133.29	4253285.42	-45.03	3.36	-12	15	0.106	-0.01	0.65	6	32	0.813	ap6, good small target on surface, 1
Tr 17-8	-4772.73	-1678.61	319227.27	4253321.39	-45.28	3.38	-31	95	0.185	0.23	3.45	35	46	0.928	not ap, crab trap, 3
Tr 17-9	-4762.04	-1674.21	319237.96	4253325.79	-45.10	3.41	-31	312	0.247	0.02	8.18	76	36	0.825	not ap, crab trap?, 3
Tr 17-10	-4702.12	-1659.15	319297.88	4253340.86	-45.26	3.6	-9	65	0.137	-0.01	1.38	78	90	0.811	ap8, small for crab trap, 3
Tr 17-11	-4272.60	-1510.25	319727.40	4253489.76	-46.13	3.95	-13	16	0.113	0.46	0.78	74	201	0.684	ap9, looks like clutter, 4
Tr 17-12	-4056.54	-1424.75	319943.46	4253575.25	-44.20	3.07	-26	51	0.133	-0.67	1.26	23	58	0.958	ap10, inverted on surface, dig. 1
Tr 17-13	-4007.59	-1410.89	319992.41	4253589.11	-44.98	6.08	-17	237	0.231	-2.75	6.71	74	339	0.956	ap11, crab trap?, 3
Tr 17-14	-3850.61	-1356.59	320149.39	4253643.41	-47.39	5.26	-42	178	0.205	0.37	4.65	67	186	0.911	ap12, looks like anchor, 4
Tr 17-15	-3820.05	-1346.77	320179.95	4253653.23	-47.27	4.91	-11	45	0.151	0.6	1.86	25	332	0.709	ap13, part signature, 2
Tr 17-16	-3252.89	-1142.52	320747.11	4253857.48	-49.62	6.57	-90	41	0.175	1.39	2.91	-17	317	0.573	ap11, good target, too deep?, 2
Tr 17-17	-3191.81	-1121.58	320808.19	4253878.42	-47.00	5.09	-7	16	0.062	-0.13	0.13	52	293	0.690	ap17, very small target on surface, pick it up, 1
Tr 17-18	-2619.06	-923.57	321380.94	4254076.43	-45.55	3.52	-21	365	0.234	0.23	6.98	89	61	0.943	ap19, crab trap, 3
Tr 17-19	-1977.37	-699.71	322022.63	4254300.29	-44.52	2.24	-58	60	0.159	0.44	2.19	2	268	0.961	ap20, crab trap?, 3
Tr 17-20	-780.31	-282.56	323219.69	4254717.44	-45.08	3.12	-21	27	0.132	0.15	1.25	5	239	0.963	ap23, inverted, dig this, 1
Tr 17-21	-341.75	-130.41	323658.25	4254869.59	-45.78	3.35	-4	16	0.099	0.67	0.53	32	284	0.643	ap24, small target, too deep?, 2
Tr 17-22	121.69	30.20	324121.69	4255030.20	-45.56	3.55	-13	44	0.120	0.17	0.93	26	115	0.847	ap25, inverted target, 1
Tr 17B-1	-9793.51	-3436.92	314206.49	4251563.09	-50.73	8.10	28	-30	0.222	1.06	5.94	-22	323	0.922	not ap, crab pot, 3
Tr 17B-2	-9670.41	-3399.86	314329.59	4251600.14	-50.01	7.86	542	-46	0.274	0.51	11.15	52	182	0.961	ap 0, crab pot, 3
Tr 17B-3	-8749.09	-3071.33	315250.91	4251928.67	-49.04	6.77	8	-7	0.104	0.60	0.61	6	94	0.868	not ap, very small targ, too deep?, 1
Tr 17B-4	-7123.19	-2509.06	316876.81	4252490.94	-48.34	6.11	13	-17	0.122	0.64	0.99	-1	318	0.963	ap 5, good target, too deep?, 1
Tr 17B-5	-6981.09	-2449.97	317018.91	4252550.03	-46.47	4.18	80	-16	0.156	0.69	2.07	41	359	0.878	ap 6, crab pot, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 18

Sun Oct 28 13:30:05 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 18-1	-10974.21	-3984.91	313025.78	4251015.09	-46.43	4.48	375.8	-133.6	0.274	0.41	11.22	38	359	0.850	ap 0, crab pot, 3
Tr 18-2	-10931.08	-3969.77	313068.92	4251030.23	-47.12	5.24	232.6	-106.1	0.198	0.23	4.22	25	299	0.947	ap 1, crab pot?, 3
Tr 18-3	-10687.95	-3879.51	313312.05	4251120.49	-50.17	6.81	136.9	-87.1	0.182	1.7	3.29	5	167	0.987	ap 2, inverted, too deep?, 1
Tr 18-4	-10641.31	-3867.78	313358.69	4251132.22	-50.53	7.91	12.5	-12.2	0.073	0.99	0.21	-18	216	0.754	ap3, looks like clutter, 3
Tr 18-5	-10627.37	-3866.38	313372.63	4251133.62	-50.92	8.32	54.8	-60.8	0.158	1.17	2.13	2	36	0.898	ap 4, too deep?. 1
Tr 18-6	-9954.04	-3628.57	314045.96	4251371.43	-51.49	9.37	20.1	-15.1	0.135	0.43	1.35	-6	77	0.852	not ap, inverted target, 1
Tr 18-7	-9870.97	-3600.81	314129.03	4251399.19	-50.85	8.89	502	-122.8	0.273	0.35	11.00	43	254	0.989	ap 5, crab pot, 3
Tr 18-8	-9149.92	-3348.40	314850.08	4251651.60	-49.05	7.68	140.6	-30.2	0.157	-0.2	2.08	89	16	0.418	ap7, not a crab pot, 1
Tr 18-9	-7133.09	-2636.00	316866.91	4252364.00	-50.09	7.63	593.2	-112.2	0.400	0.85	34.68	70	264	0.956	ap 9, large for crab pot?, 1
Tr 18-10	-7053.93	-2609.52	316946.07	4252390.48	-49.48	7.35	112	-11.1	0.170	0.5	2.69	84	280	0.962	ap 10, large target, 1
Tr 18-11	-6758.32	-2505.45	317241.68	4252494.55	-48.27	5.9	16.9	-16.9	0.130	0.68	1.20	3	40	0.892	ap 11, medium sized target, 1
Tr 18-12	-6619.11	-2455.94	317380.89	4252544.06	-47.75	4.39	350.8	-40.1	0.266	1.7	10.27	84	21	0.939	ap12, target with much clutter about, too deep, check it out, 1
Tr 18B-1	-5446.58	-2042.34	318553.42	4252957.66	-45.36	3.16	15	-14	0.111	0.43	0.75	14	13	0.897	ap0, good small target, 1
Tr 18B-2	-5127.87	-1932.64	318872.13	4253067.36	-44.92	3.39	496	-58	0.219	-0.14	5.71	61	192	0.541	ap 1, crab trap, 3
Tr 18B-3	-4872.11	-1845.18	319127.89	4253154.82	-46.05	3.73	24	-27	0.183	0.52	3.31	-14	317	0.867	ap3, good target, not crab trap, 1
Tr 18B-4	-4695.01	-1784.89	319304.99	4253215.11	-45.96	4.31	281	-74	0.249	-0.12	8.34	53	305	0.958	ap 5, crab trap, 3
Tr 18B-5	-4430.75	-1691.44	319569.25	4253308.56	-46.57	4.31	64	-7	0.153	0.43	1.96	40	92	0.530	ap 6, crab trap, 3
Tr 18B-6	-4331.17	-1657.11	319668.83	4253342.89	-47.02	4.55	86	-118	0.246	0.64	8.05	3	33	0.947	ap 7, crab trap, 3
Tr 18B-7	-3928.50	-1516.54	320071.50	4253483.46	-48.00	6.58	215	-27	0.231	-0.39	6.65	71	43	0.986	ap 8, crab trap, 3
Tr 18B-8	-3576.22	-1390.62	320423.78	4253609.38	-48.27	6.3	113	-14	0.179	0.13	3.12	60	253	0.884	ap 11, crab trap, 3
Tr 18B-9	-3360.46	-1311.95	320639.54	4253688.05	-47.46	4.11	242	-304	0.657	1.26	154.03	-61	347	0.848	ap13, crab trap, 3
Tr 18B-1	-3015.21	-1185.58	320984.79	4253814.42	-46.57	4.26	10	-8	0.102	0.45	0.58	7	276	0.788	ap 14, good very small target, 1
Tr 18B-1	-2981.15	-1177.53	321018.85	4253822.47	-46.26	3.89	16	-7	0.112	0.52	0.77	22	7	0.870	ap 15, good small target, 1
Tr 18B-1	-2975.05	-1174.96	321024.95	4253825.04	-46.22	3.81	16	-9	0.108	0.54	0.68	31	25	0.854	ap 16, good very small target, 1
Tr 18B-1	-2968.14	-1173.42	321031.86	4253826.58	-46.02	3.74	5	-4	0.066	0.45	0.16	28	282	0.545	not ap, very small target, 1
Tr 18B-1	-2303.68	-947.53	321696.32	4254052.47	-45.34	3.48	106	-25	0.196	0.08	4.08	33	299	0.741	ap17, crab trap, 3
Tr 18B-1	-321.33	-255.20	323678.67	4254744.80	-45.44	3.37	16	-19	0.114	0.08	0.79	9	341	0.921	ap 22, small target, 1
Tr 18B-1	120.87	-95.25	324120.87	4254904.75	-45.72	3.57	68	-48	0.167	0.26	2.55	4	144	0.969	ap24, small for crab trap, 1
Tr 18B-1	318.12	-29.91	324318.12	4254970.09	-45.80	3.68	127	-25	0.163	0.10	2.33	50	224	0.933	ap 25, inverted target, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 19

Tue Oct 23 18:06:55 2007
SENSOR: mmag
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 19-1	-11507.24	-4304.41	312492.76	4250695.59	-44.93	3.27	1320	-760	0.554	0.00	92.39	12	228	0.981	ap0, too massive for UXO, 3
Tr 19-2	-11409.40	-4270.46	312590.60	4250729.55	-46.46	4.52	103.8	-19.9	0.234	0.07	6.95	80	11	0.954	ap1, crab trap, 3
Tr 19-3	-11364.07	-4252.04	312635.93	4250747.96	-48.21	6.32	46	-4.3	0.329	0.16	19.32	68	334	0.844	not ap, partial signature, 1
Tr 19-4	-11334.01	-4247.23	312665.99	4250752.77	-49.02	7.22	131.6	-9.4	0.154	0.14	1.98	77	247	0.381	not ap, crab trap, 3
Tr 19-5	-11052.00	-4148.55	312948.00	4250851.45	-51.28	8.83	26.6	-22.7	0.137	0.75	1.39	1	228	0.973	ap3, inverted target, too deep? 1
Tr 19-6	-11019.02	-4135.98	312980.98	4250864.02	-51.38	9.04	72.6	-57	0.187	0.69	3.53	14	52	0.963	ap4, crab trap, 3
Tr 19-7	-10439.63	-3927.54	313560.37	4251072.46	-52.18	10.43	75.9	-7.5	0.169	0.07	2.60	79	222	0.799	ap5, crab trap, 3
Tr 19-8	-10010.83	-3779.19	313989.17	4251220.81	-53.25	9.41	16.7	-5.4	0.201	2.13	4.44	79	287	0.639	ap7, crab trap, 3
Tr 19-9	-9427.23	-3574.41	314572.77	4251425.59	-50.37	7.8	13.1	-10.5	0.135	0.77	1.32	20	12	0.935	ap9, good target, too deep?, 1
Tr 19-10	-8917.96	-3398.20	315082.04	4251601.80	-49.25	7.38	402.6	-49	0.279	0.06	11.84	88	90	0.888	ap10, part signature, 3
Tr 19-11	-8905.39	-3390.90	315094.61	4251609.10	-49.60	7.37	153.4	-59.7	0.274	0.47	11.13	22	35	0.770	ap11, crab trap, 3
Tr 19-12	-8021.29	-3081.17	315978.71	4251918.83	-49.60	7.05	11.5	-5.1	0.133	0.72	1.27	16	87	0.847	ap13, too deep?, 2
Tr 19-13	-8015.15	-3077.83	315984.85	4251922.17	-49.04	7.03	16.4	-4.9	0.103	0.19	0.60	86	90	0.839	ap14, small target, 1
Tr 19-14	-8009.74	-3075.99	315990.26	4251924.01	-48.61	7.02	10.7	-8.2	0.086	-0.22	0.34	15	31	0.817	not ap, too close to dig
Tr 19-15	-8005.62	-3075.03	315994.38	4251924.97	-49.24	7	28.2	-19.5	0.163	0.42	2.36	6	277	0.853	ap15, too close to dig
Tr 19-16	-7999.70	-3073.19	316000.30	4251926.81	-48.46	6.98	14.4	-11.6	0.083	-0.34	0.31	26	125	0.762	not ap, too close to dig
Tr 19-17	-7992.59	-3071.09	316007.41	4251928.91	-49.03	6.95	30.2	-23.1	0.148	0.25	1.77	15	101	0.883	ap17, too close to dig
Tr 19-18	-7957.48	-3057.92	316042.52	4251942.08	-49.24	7	13.6	-3.5	0.115	0.43	0.83	31	360	0.853	ap19, small target, 1
Tr 19-19	-7841.28	-3019.62	316158.72	4251980.38	-49.27	7.2	8.9	-2.8	0.095	0.24	0.46	50	332	0.933	not ap, very small target, 1
Tr 19-20	-7579.21	-2928.09	316420.79	4252071.91	-49.42	7.34	194.3	-17.6	0.235	0.24	7.04	82	304	0.973	ap211, crab pot, 3
Tr 19-21	-7311.97	-2834.57	316688.03	4252165.43	-49.21	7.51	325.3	-29.8	0.206	-0.11	4.74	61	343	0.888	ap22, crab pot, 3
Tr 19-22	-6605.34	-2578.99	317394.66	4252421.01	-49.22	7.1	142.1	-8.3	0.192	0.24	3.87	53	106	0.926	ap23, crab pot, 3
Tr 19-23	-6484.22	-2541.43	317515.78	4252458.57	-49.48	7.08	264.9	-49.8	0.310	0.56	16.13	56	331	0.759	ap24, crab pot, 3
Tr 19-24	-6400.69	-2512.06	317599.31	4252487.94	-48.58	6.28	15.3	-8.9	0.092	0.45	0.42	21	36	0.936	ap25, good small target, 1
Tr 19-25	-6298.89	-2478.77	317701.11	4252521.23	-48.28	5.36	13.1	-10.9	0.100	0.97	0.54	5	299	0.929	ap27, good small target, too deep?, 1
Tr 19-26	-6203.53	-2503.27	317796.47	4252496.73	-48.85	5	53.6	-33.4	0.169	2.1	2.61	25	332	0.973	ap28, crab pot, 3
Tr 19-27	-6114.25	-2527.81	317885.75	4252472.19	-52.57	6.03	29	-17.9	0.177	4.63	2.99	6	305	0.906	ap 30, crab pot part signature, 3
Tr 19-28	-5496.60	-2199.82	318503.40	4252800.18	-45.35	3.34	206.9	-78.6	0.239	0.13	7.42	12	125	0.852	ap32, crab pot, 3
Tr 19-29	-4939.34	-2033.47	319060.66	4252966.53	-46.59	4.7	76.9	-10.2	0.159	0.04	2.17	71	297	0.939	ap36, crab pot, 3
Tr 19-30	-4768.81	-2004.53	319231.18	4252995.47	-47.56	6.18	321.7	-77.1	0.252	-0.47	8.70	26	184	0.914	ap37, large for crab pot, inverted on surface, check it out,
Tr 19-31	-4195.50	-1736.91	319804.50	4253263.09	-49.30	7.21	62.8	-32.1	0.198	0.18	4.24	24	297	0.987	ap39, crab pot, 3
Tr 19-32	-3555.53	-1515.30	320444.47	4253484.70	-52.36	9.26	312.4	-1028.8	0.712	1.25	195.56	-24	239	0.821	not ap, much too massive for UXO, ship wreck?, 4
Tr 19-33	-3475.10	-1482.67	320524.90	4253517.33	-51.04	9.21	47.1	-15.7	0.142	-0.07	1.57	28	21	0.941	ap43, small for crab pot, check it out, 1
Tr 19-34	-3453.64	-1478.51	320546.36	4253521.49	-51.53	9.88	16.3	-13.3	0.119	-0.26	0.92	88	351	0.668	ap44, good target on surface, 1
Tr 19-35	-3165.49	-1354.90	320834.51	4253645.10	-44.27	2.33	65.6	-33.9	0.140	0.01	1.49	22	288	0.975	ap46, crab pot?, 3
Tr 19-36	-1921.25	-934.32	322078.75	4254065.68	-44.93	2.21	10.5	-5.7	0.094	0.68	0.45	73	308	0.783	ap47, very small target, too deep?, 2
Tr 19-37	-792.48	-548.70	323207.52	4254451.30	-45.37	3.37	146.7	-38.9	0.202	0.07	4.44	72	90	0.788	ap51, crab pot?, 3
Tr 19-38	-625.72	-495.02	323374.28	4254504.98	-45.65	3.38	20.4	-3.7	0.110	0.36	0.73	64	331	0.794	ap55, small target, 2
Tr 19-39	-181.32	-321.89	323818.68	4254678.11	-46.10	3.58	26.1	-31.1	0.201	0.63	4.39	-9	328	0.843	ap56, crab pot?, 3
Tr 19-40	-96.36	-290.88	323903.64	4254709.12	-45.72	3.67	117.1	-8.9	0.171	0.12	2.71	63	170	0.232	not ap, crab pot, 3
Tr 19-41	239.69	-188.20	324239.69	4254811.80	-45.98	3.67	663.8	-48.7	0.257	0.15	9.16	59	139	0.134	not ap, crab pot, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY TRANSECT 20

Sat Oct 27 15:43:13 2007

PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters

SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr20-1	-5827.32	-2507.24	318172.68	4252492.76	-45.83	4.49	121	-9	0.291	-0.42	13.36	56	359	0.848	ap1, crab pot, 3
Tr20-2	-5552.67	-2359.98	318447.33	4252640.02	-46.17	4.24	25	-16	0.222	0.14	5.96	15	214	0.845	ap2, crab pot, 3
Tr20-3	-5537.43	-2348.25	318462.57	4252651.76	-48.56	3.92	14	-11	0.262	3.07	9.78	59	90	0.570	not ap, crab pot, 3
Tr20-4	-5110.55	-2188.27	318889.45	4252811.73	-47.94	5.46	66	-33	0.216	0.66	5.45	15	265	0.836	ap5, crab pot, 3
Tr20-5	-4729.62	-2060.42	319270.38	4252939.58	-49.27	7.46	838	270	0.322	0.01	18.11	70	105	0.640	not ap, crab pot, 3
Tr20-6	-4651.07	-2032.52	319348.93	4252967.48	-49.29	7.8	261	-47	0.247	-0.30	8.17	62	262	0.807	not ap, crab pot, 3
Tr20-7	-4405.62	-1947.42	319594.38	4253052.58	-50.67	8.78	28	-11	0.133	0.08	1.29	63	309	0.824	ap6, good target, 1
Tr20-8	-4107.76	-1848.51	319892.24	4253151.49	-51.61	10.13	179	-20	0.213	-0.30	5.28	70	347	0.969	ap8, crab pot, 3
Tr20-9	-3745.64	-1703.71	320254.36	4253296.29	-52.16	10.82	138	-7	0.174	-0.47	2.85	59	175	0.305	ap9, not crab pot maybe anchor or UXO, 1
Tr20-10	-2204.09	-1113.58	321795.91	4253886.42	-46.95	4.91	22	-23	0.112	0.17	0.76	-6	56	0.568	not ap, good target, 1
Tr20-11	-2189.41	-1108.20	321810.59	4253891.80	-46.81	4.89	49	-155	0.162	0.00	2.30	-41	225	0.906	ap10, looks like clutter, 3
Tr20-12	-1933.09	-1073.69	322066.91	4253926.31	-44.60	2.53	25	-26	0.120	0.17	0.94	6	304	0.849	ap11, good small target, 1
Tr20-13	-1353.81	-880.77	322646.19	4254119.23	-45.63	3.42	21	-23	0.131	0.19	1.22	14	292	0.894	ap13, good small target, 1
Tr20-14	-69.60	-429.68	323930.40	4254570.32	-45.87	3.44	15	-15	0.126	0.48	1.10	13	349	0.887	ap14, looks like clutter, 3
Tr 20b-1	-10395.36	-4042.67	313604.64	4250957.33	-51.92	9.89	25	-10	0.162	0.53	2.30	-5	345	0.952	ap1, good target, too deep?, 1
Tr 20b-2	-10306.08	-4011.33	313693.92	4250988.67	-51.51	9.80	1011	-164	0.365	0.2	26.43	65	40	0.959	ap2, crab pot, 2
Tr 20b-3	-10087.76	-3907.43	313912.24	4251092.57	-51.14	9.35	60	-8	0.142	0.24	1.54	59	69	0.643	ap3, good target, 1
Tr 20b-4	-9306.34	-3664.72	314693.66	4251335.29	-50.15	7.70	37	-28	0.188	0.85	3.58	0	185	0.926	ap5, inverted target, 2
Tr 20b-5	-9078.78	-3581.38	314921.22	4251418.62	-49.54	7.68	83	-20	0.167	0.22	2.51	44	82	0.910	ap6, good target, 1
Tr 20b-6	-8120.69	-3253.02	315879.31	4251746.98	-49.02	7.07	10	-7	0.089	0.31	0.38	30	252	0.849	ap10, very small target, 1
Tr 20b-7	-8092.57	-3240.86	315907.43	4251759.14	-49.46	7.08	44	-7	0.163	0.71	2.35	54	112	0.865	ap11, crab pot, 2
Tr 20b-8	-8072.60	-3235.08	315927.40	4251764.92	-49.02	7.07	58	-31	0.160	0.27	2.22	16	180	0.892	ap12, might be an anchor, 1
Tr 20b-9	-8059.98	-3231.28	315940.02	4251768.72	-49.46	7.07	35	-40	0.201	0.77	4.40	2	8	0.901	ap13, partial signature, too deep, 2
Tr 20b-10	-7650.15	-3087.51	316349.85	4251912.49	-49.79	7.37	37	-6	0.165	0.7	2.43	66	347	0.966	ap16, small for crab pot, too deep?, 1
Tr 20b-11	-7400.44	-2999.25	316599.56	4252000.75	-49.56	7.38	216	-12	0.250	0.51	8.52	88	229	0.986	ap17, crab pot, 2
Tr 20b-12	-6668.73	-2739.92	317331.27	4252260.08	-50.08	7.96	19	-15	0.128	0.35	1.14	-1	237	0.864	ap20, small target, inverted, 1
Tr 20b-13	-6391.73	-2647.21	317608.27	4252352.79	-49.95	8.08	290	-17	0.247	0.07	8.17	90	356	0.978	ap22, crab pot, 2
Tr 20b-14	-6331.44	-2625.06	317668.56	4252374.94	-49.93	8.05	142	-15	0.194	0.11	3.94	63	77	0.819	ap23, crab pot, 2
Tr 20b-15	-6090.31	-2546.81	317909.69	4252453.19	-51.23	7.56	62	-7	0.138	1.98	1.43	62	292	0.966	ap25, good target, adjacent targ 5 m west, 1
Tr 20b-16	-6085.09	-2543.90	317914.91	4252456.10	-51.59	7.74	71	-10	0.162	2.15	2.33	45	242	0.821	ap26, adjacent targ, 5 m east, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 21
Tue Oct 23 21:34:12 2007
SITE: Transect_21
SENSOR: mmag
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 19-1	-11076.30	-4415.25	312923.69	4250584.75	-52.4	9.9	11.6	-5.8	0.122	0.82	1.00	78	276	0.533	AP2, 2
Tr 19-2	-10718.04	-4285.68	313281.96	4250714.32	-52.4	9.6	30.7	-4	0.202	1.23	4.50	39	351	0.965	ap3, crab trap, 3
Tr 19-3	-10257.26	-4128.59	313742.74	4250871.42	-50.3	8.7	212.9	-37.4	0.172	-0.06	2.78	88	115	0.881	ap5, crab trap?, 3
Tr 19-4	-10230.33	-4119.71	313769.67	4250880.29	-50.3	8.6	131.6	-73	0.188	-0.01	3.61	22	23	0.970	ap6, crab trap?, 3
Tr 19-5	-10035.27	-4050.96	313964.73	4250949.05	-51.5	8.2	13	-5.1	0.146	1.53	1.70	56	108	0.877	ap7, good targ, too deep to dig?, 1
Tr 19-6	-10023.04	-4046.22	313976.96	4250953.78	-51.2	8.2	13.2	-5.5	0.147	1.35	1.74	34	188	0.936	ap8, good target, too deep to dig?, 1
Tr 19-7	-9743.77	-3946.26	314256.23	4251053.74	-50.4	8.1	190.2	-26	0.308	0.65	15.93	48	258	0.819	not ap, crab pot, 3
Tr 19-8	-9717.31	-3940.13	314282.69	4251059.87	-50.2	8.1	13.2	-8.3	0.122	0.45	0.99	12	182	0.918	ap10, looks like clutter, 3
Tr 19-9	-9329.61	-3790.18	314670.39	4251209.82	-49.5	7.4	139.1	-35.4	0.195	0.32	4.00	38	81	0.956	ap14, crab trap, 3
Tr 19-10	-9169.86	-3739.09	314830.14	4251260.91	-49.5	7.5	162.8	-125.9	0.248	0.23	8.33	6	257	0.975	ap16, crab trap, 3
Tr 19-11	-9106.67	-3716.03	314893.33	4251283.97	-49.5	7.5	18.3	-5.5	0.125	0.23	1.06	17	6	0.944	ap17, good target, 1
Tr 19-12	-8850.60	-3640.15	315149.40	4251359.85	-49.1	7.4	46.5	-5.8	0.128	0.00	1.14	59	240	0.928	ap?, great target, 1
Tr 19-13	-8793.13	-3621.57	315206.87	4251378.43	-49.2	7.5	90.4	-30.7	0.182	0.02	3.25	41	301	0.921	ap20, crab trap, 3
Tr 19-14	-8684.31	-3579.58	315315.69	4251420.42	-50.5	7.5	25.8	-16.7	0.194	1.28	3.93	25	127	0.567	ap21,inverted target, 3
Tr 19-15	-7651.24	-3219.89	316348.76	4251780.11	-49.3	7.6	284	-56.9	0.255	0.01	9.01	82	90	0.878	ap28, looks like a pile of clutter, 4
Tr 19-16	-7611.76	-3203.92	316388.24	4251796.08	-49.4	7.5	82.1	-70.1	0.222	0.14	5.94	4	82	0.988	ap29, crab trap?, 3
Tr 19-17	-7103.85	-3026.23	316896.15	4251973.77	-49.8	8.1	311.6	-21.6	0.251	-0.10	8.53	85	20	0.982	ap33, crab trap, 3
Tr 19-18	-6834.86	-2931.04	317165.14	4252068.96	-50.4	8.3	175.1	-116.1	0.299	0.31	14.53	22	349	0.903	ap37, crab trap, 3
Tr 19-19	-6354.52	-2763.62	317645.48	4252236.38	-50.3	8.5	234.3	-16.4	0.241	0.00	7.56	61	19	0.806	ap38, crab trap, 3
Tr 19-20	-6184.11	-2702.67	317815.89	4252297.33	-50.9	8.4	96.2	-40.3	0.249	0.68	8.43	31	46	0.895	ap39, crab trap, 3
Tr 19-21	-5778.33	-2563.17	318221.67	4252436.84	-53.3	12.9	14.6	-6.4	0.143	-1.32	1.58	84	90	0.477	ap41, crab trap, 3
Tr 19-22	-5702.55	-2527.97	318297.45	4252472.03	-53.2	11.5	12.4	-12.4	0.157	-0.13	2.12	13	269	0.939	not ap, good target, 1
Tr 19-23	-5662.82	-2513.46	318337.18	4252486.54	-52.7	10.4	280	-34.9	0.321	0.57	17.94	77	154	0.790	ap44, anchor?, 4
Tr 19-24	-5610.46	-2502.94	318389.54	4252497.06	-51.6	9.6	213.8	-16.7	0.231	0.22	6.70	89	348	0.902	not ap, crab trap, 3
Tr 19-25	-5191.33	-2360.28	318808.67	4252639.72	-50.2	7.8	47.3	-139.8	0.236	0.55	7.09	-26	103	0.931	ap47, crab trap, 3
Tr 19-26	-4943.85	-2269.43	319056.15	4252730.57	-50.6	8.8	176.5	-49	0.225	-0.13	6.17	53	39	0.713	not ap, crab trap, 3
Tr 19-27	-4930.21	-2267.76	319069.79	4252732.24	-50.8	9.1	70.2	-46.6	0.214	-0.15	5.35	6	39	0.883	ap49, crab trap, 3
Tr 19-28	-4874.07	-2247.37	319125.93	4252752.63	-50.6	9.5	617.6	-130.7	0.318	-0.77	17.52	57	349	0.940	ap50, anchor?, 4
Tr 19-29	-4550.30	-2133.69	319449.70	4252866.31	-51.6	10.3	159.9	-22.6	0.205	-0.45	4.69	72	289	0.965	ap51, crab trap, 3
Tr 19-30	-4091.78	-1973.44	319908.22	4253026.56	-52.8	11.0	34.7	-5.4	0.148	0.11	1.77	72	308	0.926	ap53, good target, 1
Tr 19-31	-1772.61	-1160.05	322227.39	4253839.95	-47.9	5.0	51.1	-35.4	0.255	1.14	8.99	14	82	0.984	ap55, crab trap, 3
Tr 19-32	-1646.30	-1095.94	322353.70	4253904.06	-47.8	5.9	16.4	-6.6	0.077	0.09	0.25	77	171	0.831	ap56, very small target, 1
Tr 19-33	-1637.06	-1093.28	322362.94	4253906.72	-47.8	5.9	15.4	-11.7	0.101	0.11	0.56	2	357	0.810	ap57, small target, 1
Tr 19-34	-1556.81	-1083.49	322443.19	4253916.51	-47.7	5.7	27.2	-22.9	0.125	0.24	1.07	0	58	0.936	ap59, good target, 1
Tr 19-35	-1245.31	-975.58	322754.69	4254024.42	-45.3	3.5	47.5	-48.3	0.150	0.01	1.85	-9	230	0.970	ap60, inverted target, 1
Tr 19-36	-653.47	-768.98	323346.53	4254231.02	-45.5	3.4	109.5	-19.6	0.185	0.20	3.43	71	1	0.963	ap61, crab trap, 3
Tr 19-37	-510.97	-718.56	323489.03	4254281.44	-45.3	3.4	438.9	-33.7	0.235	-0.12	7.02	81	90	0.840	ap62, crab trap, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT22

Wed Oct 31 11:37:46 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 22-1	-12325.30	-4993.80	311674.70	4250006.20	-50.11	7.52	197.2	-185.3	0.28	0.74	12.2073	2	20	0.90	AP 0, CRAB POT, 3
Tr 22-2	-11308.31	-4626.73	312691.69	4250373.27	-52.09	9.54	17.3	-17	0.16	0.66	2.0041	-8	102	0.89	ap 3, too deep?, 1
Tr 22-3	-11132.76	-4560.34	312867.24	4250439.66	-51.19	9.49	677.7	-95.9	0.25	-0.22	8.7730	74	141	0.69	ap 4, crab pot, 3
Tr 22-4	-10636.87	-4394.87	313363.13	4250605.13	-52.02	8.59	13.1	-2	0.13	1.54	1.3072	66	5	0.81	not ap, too deep, hot rock?, 3
Tr 22-5	-9805.36	-4101.54	314194.64	4250898.46	-50.17	7.46	29.2	-11	0.14	0.82	1.3733	26	68	0.89	ap 10, good target, 1
Tr 22-6	-9789.83	-4098.41	314210.17	4250901.59	-49.81	7.45	93.4	-9.4	0.14	0.44	1.6050	74	248	0.84	ap 11, small for crab pot, dig, 1
Tr 22-7	-9750.87	-4083.88	314249.13	4250916.12	-50.36	7.41	20.5	-10.8	0.14	1.05	1.4692	27	285	0.92	ap 12, good target, 1
Tr 22-8	-9700.65	-4065.38	314299.35	4250934.62	-50.13	7.49	64.2	-8.2	0.17	0.78	2.7645	33	224	0.57	ap13, crab pot, 3
Tr 22-9	-9579.80	-4023.42	314420.20	4250976.58	-49.75	7.38	427.7	-64.4	0.26	0.47	9.1517	76	349	0.96	ap 14, crab pot, 3
Tr 22-10	-9093.47	-3853.59	314906.53	4251146.41	-50.52	7.26	27.3	-6.5	0.17	1.31	2.6284	33	82	0.88	ap 16, crab pot, 16
Tr 22-11	-9084.97	-3850.66	314915.03	4251149.34	-50.65	7.21	23.9	-7.8	0.17	1.49	2.8824	37	58	0.89	ap 17, crab pot, 3
Tr 22-12	-8957.43	-3806.57	315042.57	4251193.43	-49.64	7.12	15.1	-12.1	0.10	0.57	0.5817	-3	159	0.89	ap 19, very small inverted target, 1
Tr 22-13	-8926.87	-3795.72	315073.13	4251204.28	-50.66	7.22	25.2	-6.7	0.17	1.49	2.4205	58	308	0.74	ap 20, crab pot, 3
Tr 22-14	-8880.19	-3779.08	315119.81	4251220.92	-50.89	7.39	12.4	-9	0.16	1.56	2.1905	24	22	0.85	ap21, too deep, hot rock?, 3
Tr 22-15	-8640.89	-3700.72	315359.11	4251299.29	-49.88	7.38	258.6	-161.6	0.28	0.55	12.0152	16	90	0.99	ap 22, crab pot, 3
Tr 22-16	-8403.41	-3567.57	315596.59	4251432.43	-50.08	7.34	21	-4.1	0.12	0.82	1.0123	58	25	0.77	ap 24, too deep?, 2
Tr 22-17	-8328.70	-3575.94	315671.30	4251424.06	-49.70	7.25	26.8	-7	0.12	0.58	0.8727	40	256	0.51	not ap, good small target, dig this, 1
Tr 22-18	-7908.90	-3440.95	316091.10	4251559.05	-50.12	7.67	58.6	-40.1	0.17	0.52	2.8243	64	5	0.72	not ap, good target, not crab trap, dig, 1
Tr 22-19	-7835.74	-3417.74	316164.26	4251582.26	-52.54	7.67	19.6	-9.3	0.25	2.96	8.7884	85	321	0.60	ap 27, crab pot, 3
Tr 22-20	-7793.48	-3400.25	316206.52	4251599.75	-50.29	7.68	14.1	-4.3	0.12	0.7	0.9598	34	117	0.89	ap 28, too deep?, 1
Tr 22-21	-7360.17	-3239.32	316639.83	4251760.68	-51.26	8	44	-45.2	0.32	1.35	17.7705	-18	335	0.87	ap 32, crab pot, 3
Tr 22-22	-7085.12	-3149.12	316914.88	4251850.88	-51.50	8.35	26.7	-24.3	0.24	1.22	7.0239	-9	318	0.95	ap 34, crab pot, 3
Tr 22-23	-5964.50	-2759.86	318035.50	4252240.14	-52.89	9.93	12.8	-13.1	0.17	0.98	2.5026	5	300	0.94	not ap, too deep?, 2
Tr 22-24	-5951.76	-2756.89	318048.24	4252243.11	-52.66	10.02	32.5	-6.3	0.15	0.69	1.9317	76	318	0.87	ap 38, small for crab pot, 3
Tr 22-25	-1617.10	-1168.15	322382.90	4253831.85	-50.82	8	22.3	-25	0.11	0.74	0.7514	1	341	0.96	ap 41, very good small target, dig this, 1
Tr 22-26	-1153.65	-1055.20	322846.35	4253944.80	-45.96	3.64	15.9	-6.2	0.09	0.33	0.3981	67	225	0.69	ap42, very small target, dig 1
Tr 22-27	-779.02	-949.56	323220.98	4254050.44	-45.68	3.37	8.4	-7.1	0.11	0.29	0.7909	13	26	0.75	ap45, small target, 1
Tr 22-28	-415.08	-815.51	323584.92	4254184.49	-45.74	3.37	16.1	-9.2	0.11	0.32	0.7394	6	101	0.81	ap 46, small inverted target, 1
Tr 22-29	546.20	-490.86	324546.20	4254509.14	-46.19	3.67	167.1	-49.1	0.19	0.49	3.8268	45	54	0.48	ap 49, crab pot, 3

MTADS TARGET REPORT FOR THE MTA BLOSSOM POINT SURVEY, TRANSECT 23

Wed Oct 24 15:10:17 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr23-1	-10231.57	-4388.11	313768.43	4250611.89	-49.46	7.63	51.6	-5.9	0.113	0.37	0.79	72	255	0.330	not ap, part signature, good small target, 1
Tr23-2	-9978.83	-4299.34	314021.17	4250700.66	-49.48	7.23	44.1	-32.6	0.155	0.73	2.01	17	315	0.950	ap1, too deep to dig?, 2
Tr23-3	-9901.40	-4269.86	314098.60	4250730.14	-50.02	7.17	62.2	-32.1	0.215	1.39	5.36	20	19	0.714	ap2, crab trap, 3
Tr23-4	-9557.73	-4148.40	314442.27	4250851.60	-49.52	7.08	418.2	-227.6	0.362	1.04	25.78	27	306	0.853	ap3, large crab trap, 3
Tr23-5	-9467.49	-4113.48	314532.51	4250886.52	-50.37	7.11	36.8	-4.9	0.187	1.87	3.57	71	161	0.549	notap, small for crab trap, too deep to dig?, 2
Tr23-6	-8957.21	-3949.92	315042.79	4251050.08	-50.07	7.25	120.6	-21.6	0.250	1.41	8.52	50	303	0.311	not ap, crab pot, 3
Tr23-7	-8448.53	-3792.63	315551.47	4251207.37	-49.62	7.4	121.5	-7.5	0.187	0.84	3.53	67	65	0.984	ap7, crab pot, 3
Tr23-8	-7057.61	-3269.51	316942.39	4251730.49	-50.55	8.73	177.2	-4.9	0.239	0.35	7.37	78	121	0.630	ap9, crab trap, 3
Tr23-9	-6542.27	-3086.02	317457.73	4251913.98	-51.18	10	52.9	-83.8	0.185	-0.35	3.44	-11	67	0.993	ap10, crab trap, 3
Tr23-10	-6284.37	-2993.16	317715.63	4252006.84	-52.17	10.33	160.6	-5	0.251	0.31	8.59	53	116	0.802	ap11, crab trap, 3
Tr23-11	-6055.86	-2919.44	317944.14	4252080.56	-53.27	10.88	51.2	-6.1	0.290	0.87	13.23	62	341	0.602	not ap, crab pot, 3
Tr23-12	-887.59	-1116.17	323112.41	4253883.83	-45.76	3.53	65.1	-99.8	0.201	0.46	4.40	-4	354	0.942	ap15, partial signatue, crab pot?, 3
Tr23-13	-220.29	-876.76	323779.71	4254123.24	-45.33	3.38	594.1	-90.2	0.271	0.29	10.85	66	312	0.938	ap16, crab pot, 3
Tr23-14	377.14	-663.62	324377.14	4254336.38	-46.22	3.67	19.4	-18.6	0.146	0.89	1.68	8	341	0.898	ap18, part signature, too deep to dig?, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 29

Sat Oct 27 10:19:45 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						Analyst Comments
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Comments
Tr 29-1	-12009.76	-5781.16	311990.24	4249218.84	-48.98	7.6	161	-47	0.224	-0.37	6.14	65	90	0.463	ap0, crab pot, 3
Tr 29-2	-9905.49	-5069.31	314094.51	4249930.69	-50.25	7.83	38	-3	0.146	0.85	1.68	79	166	0.937	ap1, crab trap, 3
Tr 29-3	-9893.76	-5064.64	314106.24	4249935.36	-49.74	7.83	211	-23	0.193	0.36	3.90	73	110	0.966	ap2, may not be crab trap, 1
Tr 29-4	-9792.70	-5024.35	314207.30	4249975.65	-49.97	8.16	57	-66	0.162	0.27	2.33	-4	83	0.983	ap3, small for crab trap, 1
Tr 29-5	-8279.87	-4498.94	315720.13	4250501.06	-47.96	6.31	226	-16	0.210	0.05	5.04	84	358	0.969	ap6, crab trap, 3
Tr 29-6	-8184.41	-4464.79	315815.59	4250535.21	-49.30	6.11	44	-2	0.221	1.59	5.84	81	16	0.556	ap8, crab trap, 3
Tr 29-7	-8075.34	-4426.42	315924.66	4250573.58	-47.74	6.09	9	-2	0.072	0.04	0.20	51	75	0.829	not ap, very small target on surface, 1
Tr 29-8	-7805.69	-4320.49	316194.31	4250679.51	-45.65	5.84	601	-430	2.661	-1.82	*********	29	355	0.704	not ap, this is as big as a ship, check it out, 1
Tr 29-10	-7356.42	-4170.65	316643.58	4250829.35	-47.58	5.6	340	-20	0.203	0.37	4.51	57	175	0.253	ap13, crab trap, 3
Tr 29-11	-7349.79	-4167.61	316650.21	4250832.39	-47.89	5.62	27	-27	0.135	0.67	1.33	16	16	0.886	ap14, very good target, 1
Tr 29-12	-6735.46	-3910.81	317264.54	4251089.19	-50.39	8.52	18	-21	0.133	0.17	1.28	7	276	0.876	ap15, inverted target on surface, 1
Tr 29-13	-4286.37	-3103.73	319713.63	4251896.27	-50.53	8.29	21	-12	0.159	0.56	2.20	25	314	0.940	ap 16, good target, 1
Tr 29-14	-4246.94	-3087.23	319753.06	4251912.77	-49.74	7.96	160	-15	0.182	0.17	3.27	49	91	0.544	ap17, crab pot, 3
Tr 29-15	-4092.77	-3030.60	319907.23	4251969.40	-50.09	8.3	7	-7	0.096	0.06	0.49	3	54	0.975	not ap, very small target, 1
Tr 29-16	-4021.56	-3006.44	319978.44	4251993.56	-50.45	8.24	9	-13	0.132	0.49	1.24	3	100	0.842	ap16, good target, 1
Tr 29-17	-3034.64	-2659.79	320965.36	4252340.21	-45.49	3.85	375	-408	0.448	-0.11	48.93	-2	36	0.787	ap20,21, massive target on surface, check it out, 1

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 31

Wed Oct 31 08:14:22 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: Latitude/Longitude, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 31-1	-10102.74	-5404.73	313897.26	4249595.27	-49.98	8.17	48	-20	0.134	0.16	1.31	29	66	0.969	ap 0, good target, 1
Tr 31-2	-9810.95	-5304.96	314189.05	4249695.04	-49.45	7.48	37	-10	0.120	0.32	0.95	84	181	0.350	not ap, good target, 1
Tr 31-3	-8490.52	-4836.21	315509.48	4250163.79	-47.34	5.15	11	-8	0.100	0.52	0.54	10	229	0.902	ap 3, very small inverted target, 1
Tr 31-4	-8408.97	-4804.86	315591.03	4250195.14	-47.68	5.29	13	-10	0.128	0.74	1.15	12	46	0.951	ap 4, small target, too deep?, 1
Tr 31-5	-5851.38	-3913.45	318148.62	4251086.55	-47.63	5.35	23	-17	0.142	0.64	1.55	8	233	0.952	ap 9, inverted signal, 1
Tr 31-6	-5633.04	-3843.79	318366.95	4251156.21	-47.79	5.67	23	-5	0.114	0.47	0.80	75	76	0.953	ap 11, good small target, 1
Tr 31-7	-4402.30	-3409.33	319597.70	4251590.67	-48.18	6.25	337	-13	0.214	0.21	5.34	67	344	0.821	ap 14, crab trap, 3

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 34

Sat Oct 27 15:20:17 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 34-1	-8826.44	-5220.89	315173.56	4249779.11	-50.29	5.23	10	-6	0.362	3.42	25.68	-13	101	0.583	not ap, poor fit, crab pot, 3
Tr 34-2	-8287.52	-5028.24	315712.48	4249971.77	-47.35	5.43	522	-46	0.317	0.23	17.27	52	155	0.956	ap4, crab pot, 3
Tr 34-3	-7984.04	-4923.19	316015.96	4250076.81	-47.08	5.78	328	-31	0.206	-0.39	4.73	58	165	0.796	ap5, crab pot, 3
Tr 34-4	-7620.88	-4800.70	316379.12	4250199.30	-47.32	5.56	17	-1	0.090	0.08	0.39	41	333	0.722	ap5, good small target, 1
Tr 34-5	-7503.57	-4757.00	316496.43	4250243.00	-47.33	5.38	360	-168	0.264	0.23	10.00	25	329	0.973	ap7, crab pot, 3
Tr 34-6	-6116.54	-4269.38	317883.46	4250730.62	-48.36	6.19	11	-10	0.098	0.44	0.51	3	344	0.898	ap8, very small target, too deep to dig?, 1
Tr 34-7	-5436.43	-4030.17	318563.57	4250969.83	-49.18	5.67	72	-34	0.265	1.77	10.11	26	345	0.920	ap11, crab pot, 3
Tr 34-8	-5401.81	-4015.11	318598.19	4250984.89	-48.25	5.24	55	-21	0.176	1.25	2.98	52	35	0.927	ap15, good target, too crowded to dig, 2
Tr 34-9	-4566.46	-3714.52	319433.54	4251285.48	-47.00	3.92	22	-4	0.170	1.31	2.66	35	3	0.889	ap18, not crab pot, too deep to dig, 2

MTADS TARGET REPORT BLOSSOM POINT MTA SURVEY, TRANSECT 36

Wed Oct 31 08:26:27 2007

PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters

SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Tr 36-1	-10939.55	-6230.60	313060.45	4248769.40	-49.39	7.61	19	-22	0.137	0.22	1.38	-6	274	0.945	ap 0, inverted signal, 1
Tr 36-2	-10193.66	-5881.42	313806.34	4249118.58	-46.43	4.34	21	-29	0.115	0.46	0.82	-5	219	0.896	ap 1, looks like clutter, 2
Tr 36-3	-9914.20	-5835.04	314085.80	4249164.96	-44.68	2.65	12	-13	0.121	0.42	0.96	7	263	0.854	ap?, inverted signal, 1
Tr 36-4	-9155.93	-5597.45	314844.07	4249402.55	-45.70	3.75	27	-6	0.111	0.32	0.75	48	261	0.801	ap 5, small target, dig, 1
Tr 36-5	-8188.47	-5258.05	315811.53	4249741.95	-46.08	4.20	257	-96	0.241	0.17	7.62	38	323	0.970	ap 8, crab trap, 3
Tr 36-6	-6993.28	-4840.57	317006.72	4250159.43	-46.10	3.83	18	-4	0.112	0.58	0.77	58	236	0.748	ap 9, small target, 1

MTA Blanket Survey

MTADS TARGET REPORT BLOSSOM POINT MTA BLANKET SURVEY
Thu Feb 26 10:45:34 2009
SENSOR: mmag
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information										Target Fit Information					
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Burial Depth (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comment
1	-4402.30	-927.34	319597.70	4254072.66	-45.60	0.41	3.37	18	-10	0.110	0.72	21	17	0.963	single track, far east, 1
2	-4420.61	-918.57	319579.39	4254081.43	-45.72	0.79	3.37	15	-25	0.120	0.93	-19	59	0.859	remnant moment, too deep?, 2
3	-4345.71	-910.70	319654.29	4254089.30	-45.51	0.31	3.38	14	-5	0.086	0.34	31	299	0.880	very small, far east, 1
4	-4192.22	-843.72	319807.78	4254156.28	-45.19	0.2	3.32	30	-10	0.107	0.66	39	31	0.898	excellent prospect, far east, 1
5	-4215.74	-860.49	319784.26	4254139.51	-45.32	0.2	3.32	14	-22	0.112	0.77	-9	21	0.910	large remnant, 2
6	-4221.95	-848.50	319778.05	4254151.50	-45.34	0.39	3.36	29	-18	0.123	1.01	20	113	0.891	inverted signal, far east, 1
7	-4287.58	-846.63	319712.42	4254153.37	-45.38	0.45	3.37	12	-15	0.096	0.49	3	322	0.874	very small, some remnant, 2
8	-4323.17	-856.31	319676.83	4254143.69	-45.58	0.4	3.37	22	-26	0.124	1.04	-1	290	0.951	good prospect, far east, 1
9	-4327.65	-861.97	319672.35	4254138.03	-45.59	0.63	3.37	26	-25	0.120	0.94	5	323	0.972	too deep?, 2
10	-4386.22	-848.11	319613.78	4254151.89	-45.00	0.45	3.07	29	-83	0.175	2.90	-22	295	0.923	strong remnant, 2
11	-4422.60	-821.41	319577.40	4254178.59	-45.34	0.63	2.57	18	-25	0.144	1.61	0	42	0.927	single track, far east, too deep?, 1
12	-4306.69	-807.01	319693.31	4254192.99	-45.35	-0.05	3.35	21	-26	0.110	0.72	-15	83	0.853	small inverted target, on surface, 1
13	-4291.90	-803.98	319708.10	4254196.02	-45.48	0.13	3.36	32	-17	0.127	1.11	16	63	0.950	small target on surface, 1
14	-4274.20	-834.85	319725.80	4254165.15	-45.35	0.27	3.37	63	-63	0.168	2.56	2	53	0.961	small for crab pot, check it?, 1
15	-4214.76	-802.38	319785.24	4254197.62	-45.07	0.08	3.37	24	-7	0.093	0.43	37	298	0.838	very small targ, on surface, 1
16	-4205.42	-806.78	319794.58	4254193.22	-45.21	0.17	3.37	15	-18	0.107	0.67	1	25	0.938	very small target on surface, 2
17	-4146.72	-822.57	319853.28	4254177.43	-45.84	0.93	3.26	22	-8	0.144	1.62	41	342	0.945	too deep, 2
18	-4147.71	-809.63	319852.29	4254190.37	-45.57	0.68	3.3	22	-10	0.113	0.78	89	90	0.790	small target, too deep?, 2
19	-4119.19	-818.46	319880.81	4254181.54	-45.03	0.13	3.21	36	-12	0.104	0.62	64	323	0.860	small shallow target, 1
20	-3986.48	-758.02	320013.52	4254241.98	-44.27	0.41	2.21	68	-62	0.143	1.59	4	55	0.949	good midsized target, 1
21	-4001.01	-754.56	319998.99	4254245.44	-44.58	0.58	2.35	30	-24	0.123	1.01	15	52	0.949	good small target, 1
22	-4026.85	-785.41	319973.15	4254214.59	-44.68	0.15	2.79	72	-52	0.129	1.16	-2	162	0.943	inverted small target on surface, 1
23	-4048.49	-793.61	319951.51	4254206.40	-45.42	0.62	3.07	46	-17	0.153	1.93	48	57	0.954	too deep, 2
24	-4045.21	-781.15	319954.79	4254218.85	-45.19	0.52	3.04	70	-44	0.174	2.87	17	316	0.979	possible crab pot, 3
25	-4083.74	-789.61	319916.26	4254210.39	-45.11	0.35	3.19	38	-56	0.153	1.93	-1	1	0.974	mid sized target, possible crab pot, 2
26	-4126.04	-775.00	319873.96	4254225.00	-45.63	0.64	3.33	18	-16	0.134	1.29	1	272	0.862	small target, too deep?, 2
27	-4151.61	-774.98	319848.39	4254225.02	-45.18	0.25	3.35	23	-20	0.118	0.90	-3	66	0.909	good prospect, 1
28	-4160.05	-791.76	319839.95	4254208.24	-45.24	0.17	3.34	22	-14	0.109	0.71	15	290	0.967	good small shallow target, 1
29	-4199.64	-787.96	319800.36	4254212.04	-45.43	0.47	3.37	24	-16	0.128	1.14	25	317	0.933	good small target, 1
30	-4211.92	-761.26	319788.08	4254238.74	-45.13	-0.24	3.29	36	-38	0.129	1.15	3	327	0.944	excellent target, on surface, 1
31	-4237.95	-777.13	319762.05	4254222.87	-45.24	-0.2	3.35	31	-28	0.126	1.07	-7	142	0.940	inverted small target on surface, 1
32	-4259.27	-784.52	319740.73	4254215.48	-45.61	0.18	3.36	20	-45	0.162	2.32	-8	2	0.955	doesnt look like uxo, 3
33	-4292.00	-788.81	319708.00	4254211.19	-45.51	0.13	3.32	31	-27	0.138	1.44	-2	86	0.815	good shallow target, 1
34	-4325.98	-772.38	319674.02	4254227.62	-45.17	-0.11	3.24	82	-41	0.169	2.63	28	337	0.967	possible crab pot, 3
35	-4436.62	-777.08	319563.38	4254222.92	-44.76	0.75	2.3	50	-39	0.150	1.82	12	71	0.967	good target, too deep?, 1
36	-4465.19	-745.99	319534.81	4254254.01	-44.78	0.61	2.46	33	-27	0.151	1.88	-6	224	0.948	inverted target, too deep?, 2
37	-4404.46	-737.68	319595.54	4254262.32	-44.77	0.52	2.52	24	-9	0.101	0.56	33	51	0.924	small target too deep to dig?, 1

BLANKET SURVEY CONTINUED

Measured Information										Target Fit Information					
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Burial Depth (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comment
38	-4325.42	-732.60	319674.58	4254267.40	-45.51	0.73	3.17	40	-44	0.148	1.76	-4	216	0.933	too deep to dig, 2
39	-4309.87	-737.24	319690.13	4254262.76	-45.27	0.23	3.27	27	-25	0.108	0.69	3	353	0.944	good target, 1
40	-4307.76	-722.85	319692.24	4254277.15	-45.66	0.77	3.25	40	-25	0.140	1.51	9	141	0.952	inverted signature, too deep, 2
41	-4285.27	-719.67	319714.73	4254280.33	-45.52	0.48	3.34	33	-23	0.123	1.00	11	108	0.907	inverted signature, 1
42	-4271.31	-735.30	319728.69	4254264.70	-45.23	0.09	3.25	39	-24	0.129	1.16	10	172	0.918	inverted signature, on surface, 1
43	-4063.71	-719.32	319936.29	4254280.68	-45.31	0.17	3.06	36	-28	0.135	1.35	12	54	0.934	good shallow target, 1
44	-3975.82	-743.02	320024.18	4254256.98	-44.40	0.34	2.5	47	-21	0.132	1.25	28	47	0.938	good target, 1
45	-3688.11	-681.52	320311.89	4254318.48	-45.32	0.69	2.82	24	-19	0.137	1.40	8	76	0.915	too deep, 2
46	-3749.33	-684.16	320250.67	4254315.84	-45.12	0.77	2.71	27	-13	0.129	1.16	24	273	0.911	too deep, 2
47	-3855.06	-700.32	320144.94	4254299.68	-45.32	1.32	2.52	53	-7	0.135	1.35	84	261	0.938	too deep, 2
48	-3967.36	-699.06	320032.64	4254300.94	-45.19	1	2.61	82	-7	0.164	2.41	75	198	0.967	too deep, 2
49	-4021.37	-696.56	319978.63	4254303.44	-44.64	-0.21	2.73	67	-52	0.129	1.16	12	277	0.930	good target on surface, 1
50	-4094.11	-722.58	319905.89	4254277.42	-45.15	-0.21	3.29	43	-54	0.148	1.75	-1	22	0.913	good target on surface, ignore crab pot to north, 1
51	-4103.15	-706.67	319896.85	4254293.33	-45.32	0.09	3.3	15	-27	0.121	0.97	-3	16	0.864	remnant moment, 2
52	-4171.60	-679.03	319828.40	4254320.97	-45.17	0.28	3.15	22	-32	0.112	0.77	-2	342	0.916	remnant moment, 1
53	-4143.44	-681.11	319856.56	4254318.89	-45.65	0.69	3.21	28	-8	0.122	0.98	50	272	0.902	good target, too deep?, 1
54	-4065.02	-665.97	319934.98	4254334.04	-45.37	0.52	2.88	25	-33	0.121	0.97	6	342	0.922	good target, 1
55	-4000.48	-664.53	319999.52	4254335.47	-44.18	-0.14	2.36	77	-122	0.141	1.51	-2	343	0.931	medium target of surface, 1
56	-3688.85	-660.05	320311.15	4254339.95	-45.10	0.65	2.78	23	-22	0.125	1.05	-4	64	0.951	good target, too deep?, 1
57	-3510.42	-614.10	320489.58	4254385.90	-44.99	0.25	2.81	47	-8	0.103	0.59	47	163	0.960	good small target, 1
58	-3671.18	-620.01	320328.82	4254379.99	-45.13	0.65	2.77	51	-8	0.132	1.25	85	302	0.950	too deep, 2
59	-3699.12	-617.12	320300.88	4254382.88	-44.95	0.55	2.77	40	-24	0.131	1.23	20	65	0.954	good target, 1
60	-3709.02	-648.61	320290.98	4254351.39	-44.88	0.52	2.78	33	-25	0.115	0.83	22	331	0.950	good target, area too crowded, 2
61	-3735.96	-627.51	320264.04	4254372.50	-45.09	0.7	2.77	25	-36	0.144	1.61	-2	45	0.924	too deep, 2
62	-4078.25	-625.18	319921.75	4254374.82	-45.69	0.83	3.05	25	-25	0.128	1.14	-2	103	0.960	too deep, 2
63	-4090.28	-613.21	319909.72	4254386.79	-45.81	1.02	3.06	16	-16	0.106	0.64	8	355	0.913	too deep, 2
64	-4082.66	-606.57	319917.34	4254393.43	-45.91	1.15	3.02	16	-26	0.110	0.73	-17	237	0.957	too deep, 2
65	-4048.50	-607.45	319951.50	4254392.55	-45.87	1.3	2.79	35	-18	0.122	0.97	16	261	0.873	too deep, 2
66	-3838.06	-604.83	320161.94	4254395.17	-44.64	0.24	2.32	31	-10	0.099	0.53	44	57	0.893	good target, 1
67	-3658.69	-604.63	320341.31	4254395.37	-44.79	0.41	2.78	17	-21	0.105	0.64	5	351	0.921	small target, 1
68	-3583.54	-574.81	320416.46	4254425.19	-44.94	0.57	2.78	22	-27	0.137	1.39	2	304	0.949	good target, too deep?, 1
69	-3381.43	-569.46	320618.57	4254430.54	-44.89	0.16	2.91	37	-28	0.136	1.38	10	300	0.833	good target, dig this 1
70	-3342.64	-535.40	320657.36	4254464.60	-44.88	0.42	2.79	26	-24	0.128	1.15	12	351	0.962	good target, dig this, 1
71	-3441.32	-525.04	320558.68	4254474.96	-44.18	0.2	2.38	37	-44	0.126	1.09	0	14	0.950	good target, dig this, 1
72	-3366.08	-507.40	320633.92	4254492.60	-44.77	0.47	2.63	38	-39	0.143	1.59	4	346	0.972	medium sized target, 1
73	-3370.61	-521.87	320629.39	4254478.13	-44.75	0.25	2.69	40	-26	0.133	1.29	17	293	0.953	good target, dig this, 1
74	-3173.89	-464.98	320826.11	4254535.02	-44.84	0.5	2.77	39	-18	0.137	1.40	32	29	0.942	good target, 1
75	-3322.26	-462.23	320677.74	4254537.77	-44.96	0.12	2.78	35	-16	0.140	1.49	28	14	0.914	good target, dig this, 1
76	-3413.28	-447.44	320586.72	4254552.56	-44.83	0.25	2.63	44	-29	0.134	1.30	17	349	0.879	good target, dig this, 1
77	-3344.39	-453.55	320655.61	4254546.45	-45.12	0.31	2.7	36	-29	0.144	1.62	12	12	0.870	great target dig this, hope is not a crab pot, 1
78	-3475.12	-475.99	320524.88	4254524.01	-45.05	0.38	2.64	27	-26	0.135	1.34	-5	208	0.961	inverted target, dig, 1
79	-3498.37	-424.11	320501.63	4254575.89	-45.11	0.53	2.74	31	-23	0.144	1.60	14	76	0.966	good target, 1
80	-3389.89	-403.79	320610.11	4254596.21	-45.08	0.66	2.75	27	-33	0.141	1.54	4	26	0.927	too deep?, 1
81	-3384.46	-409.71	320615.54	4254590.29	-44.96	0.39	2.73	23	-29	0.124	1.05	0	51	0.918	great target, dig, 1
82	-3066.86	-385.90	320933.14	4254614.10	-44.66	0.34	2.77	18	-21	0.113	0.79	3	11	0.958	small target, 1
83	-3217.41	-364.70	320782.59	4254635.30	-44.87	0.18	2.78	24	-18	0.125	1.07	16	13	0.921	great target, dig, 1
84	-2987.88	-241.57	321012.12	4254758.43	-45.04	0.43	2.77	21	-5	0.118	0.90	25	268	0.971	good small target, too deep?, 1

MTA Adjunct (Skiff) Surveys

MTADS TARGET REPORT BLOSSOM POINT SKIFF SURVEY, 28 OCTOBER

Sat Nov 03 12:59:38 2007
PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters
SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						
Targ ID	Local X (m)	Local Y (m)	UTM X (m)	UTM Y (m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Analyst Comments
Skiff 2-1	-8147.15	-1949.66	315852.85	4253050.34	-43.17	0.86	108	-146	0.200	0.45	4.31	-2	253	0.979	large target, shallow for crab pot, 2
Skiff 2-2	-7672.99	-2221.70	316327.01	4252778.30	-43.30	1.12	7	-4	0.076	0.46	0.24	15	30	0.943	small target, 1
Skiff 2-3	-7531.86	-2113.07	316468.14	4252886.93	-43.08	0.72	5	-6	0.059	0.51	0.11	22	268	0.787	very small target, 2
Skiff 2-4	-7531.93	-2089.08	316468.07	4252910.93	-43.05	0.71	26	-2	0.087	0.61	0.36	52	62	0.283	small target, too deep to dig?, 1
Skiff 2-5	-7435.28	-2052.22	316564.72	4252947.78	-43.22	0.73	9	-3	0.072	0.72	0.21	30	88	0.753	small target, too deep to dig?, 1
Skiff 2-6	-7404.16	-2054.62	316595.84	4252945.38	-43.56	0.71	37	-3	0.122	0.98	0.98	79	285	0.837	too deep to dig?, 1
Skiff 2-7	-7271.90	-2035.69	316728.10	4252964.31	-43.48	0.85	17	-3	0.096	0.89	0.48	80	191	0.820	small target, too deep to dig?, 1
Skiff 2-8	-6962.46	-1972.34	317037.54	4253027.66	-43.13	0.63	443	-254	0.264	0.64	10.02	14	293	0.772	large target, too shallow for crab trap, 1
Skiff 2-9	-6927.31	-1992.92	317072.69	4253007.08	-43.16	0.8	12	-7	0.079	0.56	0.27	28	86	0.804	very small target, 1
Skiff 2-10	-6840.46	-1960.59	317159.54	4253039.41	-42.47	0.69	51	-6	0.169	-0.04	2.60	55	349	0.872	medium target, difficult fit, 1
Skiff 2-11	-6977.61	-2056.70	317022.39	4252943.30	-42.93	1.12	13	-14	0.093	0.21	0.44	0	351	0.954	small target on surface, 1
Skiff 2-12	-6245.96	-1798.72	317754.04	4253201.29	-44.02	1.29	64	-46	0.223	0.83	6.06	13	299	0.985	crab trap, 3
Skiff 2-13	-6058.48	-1733.22	317941.52	4253266.78	-44.08	1.52	14	-16	0.151	0.63	1.88	8	42	0.934	small for crab pot, 1
Skiff 2-14	-6216.44	-1921.46	317783.56	4253078.54	-43.85	1.29	24	-2	0.118	0.67	0.89	89	157	0.668	good target, 1
Skiff 2-15	-6317.62	-1954.02	317682.38	4253045.98	-43.49	1.19	215	-19	0.225	0.41	6.19	74	84	0.972	crab pot?, 3
Skiff 2-16	-6589.41	-2014.93	317410.59	4252985.07	-43.06	0.81	49	-42	0.116	0.34	0.86	15	31	0.868	good target, difficult fit, 1
Skiff 2-17	-6574.02	-2045.15	317425.98	4252954.85	-43.35	0.85	11	-10	0.087	0.62	0.36	18	15	0.801	too deep to dig?, 1
Skiff 2-18	-6587.14	-2049.43	317412.86	4252950.57	-42.98	0.84	11	-5	0.057	0.26	0.10	64	185	0.499	very small target, 1
Skiff 2-19	-6774.79	-2178.16	317225.21	4252821.84	-43.88	1.08	14	-10	0.128	0.94	1.14	8	355	0.635	too deep to dig?, 1
Skiff 2-20	-7076.95	-2267.04	316923.05	4252732.96	-46.84	1.26	239	6	0.659	3.75	155.02	35	19	0.502	too big for UXO, 3
Skiff 2-21	-6988.51	-2179.56	317011.49	4252820.44	-43.38	1.07	59	-58	0.182	0.49	3.25	-6	248	0.947	inverted target, 1
Skiff 2-22	-6969.90	-2159.84	317030.10	4252840.16	-43.25	1.04	68	-29	0.157	0.38	2.10	0	191	0.944	shallow inverted target, 1
Skiff 2-23	-6945.79	-2174.86	317054.21	4252825.14	-43.17	0.97	14	-4	0.082	0.35	0.30	22	334	0.960	small shallow target, 1
Skiff 2-24	-6937.29	-2173.55	317062.71	4252826.45	-43.22	0.98	99	-65	0.165	0.42	2.45	11	230	0.943	inverted target, 1
Skiff 2-25	-6916.90	-2106.48	317083.10	4252893.52	-43.13	0.94	161	-63	0.179	0.36	3.13	20	69	0.774	good target, 1
Skiff 2-26	-7084.66	-2060.65	316915.34	4252939.35	-43.13	0.86	18	-17	0.097	0.47	0.50	12	246	0.343	good target, difficult fit, 1
Skiff 2-27	-7343.68	-2317.87	316656.32	4252682.13	-43.58	1.24	9	-15	0.113	0.54	0.78	-2	17	0.838	too close to interferring target, 2

MTADS TARGET REPORT BLOSSOM POINT SKIFF SURVEY 30 OCTOBER

Sat Nov 03 12:58:12 2007

PRIMARY COORDINATES: MTADS LOCAL - Relative to UTM (324000.00,4255000.00) meters

SECONDARY COORDINATES: UTM=18, nad83

Measured Information									Target Fit Information						Analyst Comments
Targ ID	Local X (m)	Local Y (m)	UTM X(m)	UTM Y(m)	HAE (m)	Water Depth (m)	Max Signal (nT)	Min Signal (nT)	Size (m)	Burial Depth (m)	Moment	Incl. (deg)	Azi. (deg)	Fit Qual.	Comments
Skiff 3-1	-6477.49	-1880.61	317522.51	4253119.39	-43.24	0.97	4	-7	0.075	0.60	0.23	-35	196	0.585	very small target, 2
Skiff 3-2	-6438.28	-1726.18	317561.72	4253273.82	-46.05	0.84	8	-6	0.222	3.53	5.90	7	244	0.818	too deep to dig, 2
Skiff 3-3	-6353.06	-1705.51	317646.94	4253294.49	-44.28	1.69	43	-25	0.235	0.93	7.08	13	52	0.898	may be crab pot, 3
Skiff 3-4	-6263.80	-1669.71	317736.20	4253330.29	-44.25	1.78	44	-27	0.237	0.80	7.20	21	67	0.870	may be crab pot, 2
Skiff 3-5	-6218.46	-1655.86	317781.54	4253344.14	-44.61	1.79	13	-5	0.135	1.13	1.33	79	221	0.541	small deep target, poot fit, 2
Skiff 3-6	-6209.99	-1652.81	317790.01	4253347.19	-43.56	1.78	14	-5	0.094	0.10	0.45	89	57	0.569	small shallow target, poor fit, 1
Skiff 3-7	-6445.66	-1677.17	317554.34	4253322.83	-43.18	0.77	142	-40	0.193	0.74	3.89	36	69	0.894	large target in shallow water, too deep to dig?, 1
Skiff 3-8	-6432.50	-1633.60	317567.50	4253366.40	-42.51	0.70	45	-3	0.068	0.13	0.17	67	328	0.487	small shallow target on 3 mags, 1
Skiff 3-9	-6390.14	-1589.47	317609.86	4253410.53	-42.65	0.84	42	-24	0.109	0.10	0.71	4	70	0.520	cluster of 3 targets within 2 m, 2
Skiff 3-10	-6376.53	-1577.78	317623.47	4253422.22	-42.86	0.87	9	-3	0.058	0.29	0.11	51	27	0.604	good target, 1
Skiff 3-11	-6340.13	-1565.68	317659.87	4253434.32	-45.47	0.94	10	-5	0.177	2.85	3.02	24	100	0.513	too deep to dig, 2
Skiff 3-12	-6327.00	-1562.90	317673.00	4253437.10	-43.30	1.01	11	-5	0.081	0.62	0.29	50	355	0.385	small target, difficult fit, 1
Skiff 3-13	-6322.53	-1560.34	317677.47	4253439.67	-43.59	0.98	17	-10	0.103	0.90	0.60	89	103	0.737	good target, too deep to dig?, 1
Skiff 3-14	-6306.88	-1557.37	317693.13	4253442.63	-43.04	1.10	6	-6	0.069	0.24	0.18	8	316	0.704	small target, two mags, 1
Skiff 3-15	-6319.64	-1428.08	317680.36	4253571.92	-43.16	0.68	167	-34	0.216	0.78	5.45	41	45	0.946	large target in shallow water, 1
Skiff 3-16	-6308.80	-1423.65	317691.20	4253576.35	-44.58	0.71	11	-16	0.173	2.16	2.81	-10	81	0.674	large target in shallow water, difficult fit, cant be this d
Skiff 3-17	-6226.23	-1393.85	317773.77	4253606.15	-43.58	0.96	427	-392	0.369	0.89	27.24	15	15	0.298	likely crab pot, 3
Skiff 3-18	-6097.69	-1350.46	317902.31	4253649.54	-44.28	1.94	14	-9	0.176	0.63	2.95	11	93	0.769	medium sized target, too deep to wade, 1
Skiff 3-19	-6296.10	-1394.55	317703.90	4253605.45	-42.81	0.66	19	-5	0.070	0.44	0.19	20	14	0.376	small target, poor fit, 1
Skiff 3-20	-6290.61	-1380.82	317709.39	4253619.18	-42.78	0.63	78	-18	0.098	0.41	0.50	88	354	0.793	small target, 1
Skiff 3-21	-6288.87	-1378.74	317711.13	4253621.26	-42.59	0.63	6	-9	0.049	0.22	0.06	23	346	0.858	very small target, just north of targ 20, 1
Skiff 3-22	-6202.65	-1290.97	317797.35	4253709.03	-42.90	0.73	15	-14	0.086	0.45	0.34	12	352	0.512	small target, difficult fit, 1
Skiff 3-23	-6187.37	-1274.57	317812.63	4253725.43	-42.75	0.73	14	-16	0.076	0.32	0.24	-3	81	0.744	small shallow target, 1
Skiff 3-24	-6182.77	-1267.05	317817.23	4253732.95	-42.96	0.72	204	-278	0.221	0.50	5.85	1	55	0.902	large target in shallow water, crab trap?, 2
Skiff 3-25	-6172.31	-1252.77	317827.69	4253747.23	-42.90	0.73	52	-11	0.100	0.43	0.55	30	41	0.542	target larger than the fit, 1
Skiff 3-26	-6169.40	-1248.91	317830.61	4253751.09	-42.77	0.74	47	-47	0.108	0.32	0.69	21	55	0.827	good target, 1
Skiff 3-27	-6150.05	-1235.66	317849.95	4253764.34	-43.00	0.75	93	-91	0.155	0.50	2.01	-3	293	0.640	medium target, crowded area, 1
Skiff 3-28	-6136.29	-1232.55	317863.71	4253767.45	-42.85	0.78	118	-22	0.125	0.31	1.06	42	223	0.890	good target in crowded area, 1
Skiff 3-29	-6117.90	-1222.48	317882.10	4253777.52	-42.82	0.79	15	-9	0.070	0.30	0.19	-3	230	0.697	very small target, 1
Skiff 3-30	-6110.76	-1219.97	317889.24	4253780.03	-42.88	0.85	31	-17	0.093	0.31	0.44	-10	242	0.603	small target, difficult fit, 1
Skiff 3-31	-6076.97	-1209.84	317923.03	4253790.16	-43.09	0.89	59	-82	0.152	0.45	1.89	-2	307	0.903	partial signature, 1
Skiff 3-32	-6070.09	-1207.50	317929.91	4253792.50	-43.10	0.90	48	-13	0.109	0.47	0.70	44	70	0.839	small target, 1
Skiff 3-33	-6052.44	-1199.25	317947.56	4253800.75	-42.99	0.93	51	-10	0.104	0.33	0.61	65	197	0.464	small target, difficult fit, 1
Skiff 3-34	-6036.53	-1195.26	317963.47	4253804.74	-43.01	1.01	25	-23	0.105	0.27	0.62	11	299	0.823	good target, 1
Skiff 3-35	-6132.34	-1188.72	317867.66	4253811.28	-42.81	0.69	143	-96	0.146	0.37	1.69	13	3	0.950	large target in shallow water, dig it, 1
Skiff 3-36	-6021.78	-1054.18	317978.22	4253945.82	-42.79	0.64	29	-19	0.080	0.36	0.28	7	205	0.896	small inverted target, 1
Skiff 3-37	-5972.19	-1042.57	318027.81	4253957.43	-43.07	0.77	25	-17	0.099	0.54	0.52	7	355	0.857	small target, partial signature, 1
Skiff 3-38	-5887.24	-935.48	318112.76	4254064.52	-42.93	0.71	19	-19	0.085	0.45	0.33	16	48	0.535	very small target, 1
Skiff 3-39	-5151.26	-357.72	318848.74	4254642.28	-44.06	1.76	37	-32	0.209	0.46	4.94	0	294	0.937	crab trap, 3